

MARCH 23, 1953

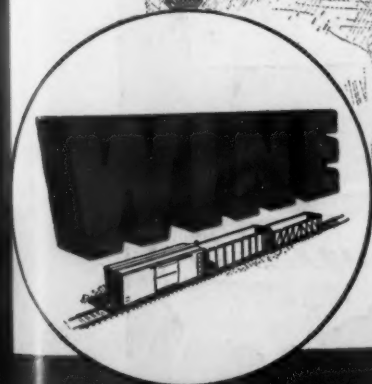
New Attack on Hot Box Problem . . . p. 65

RAILWAY AGE

The Standard Railroad WEEKLY for Almost a Century

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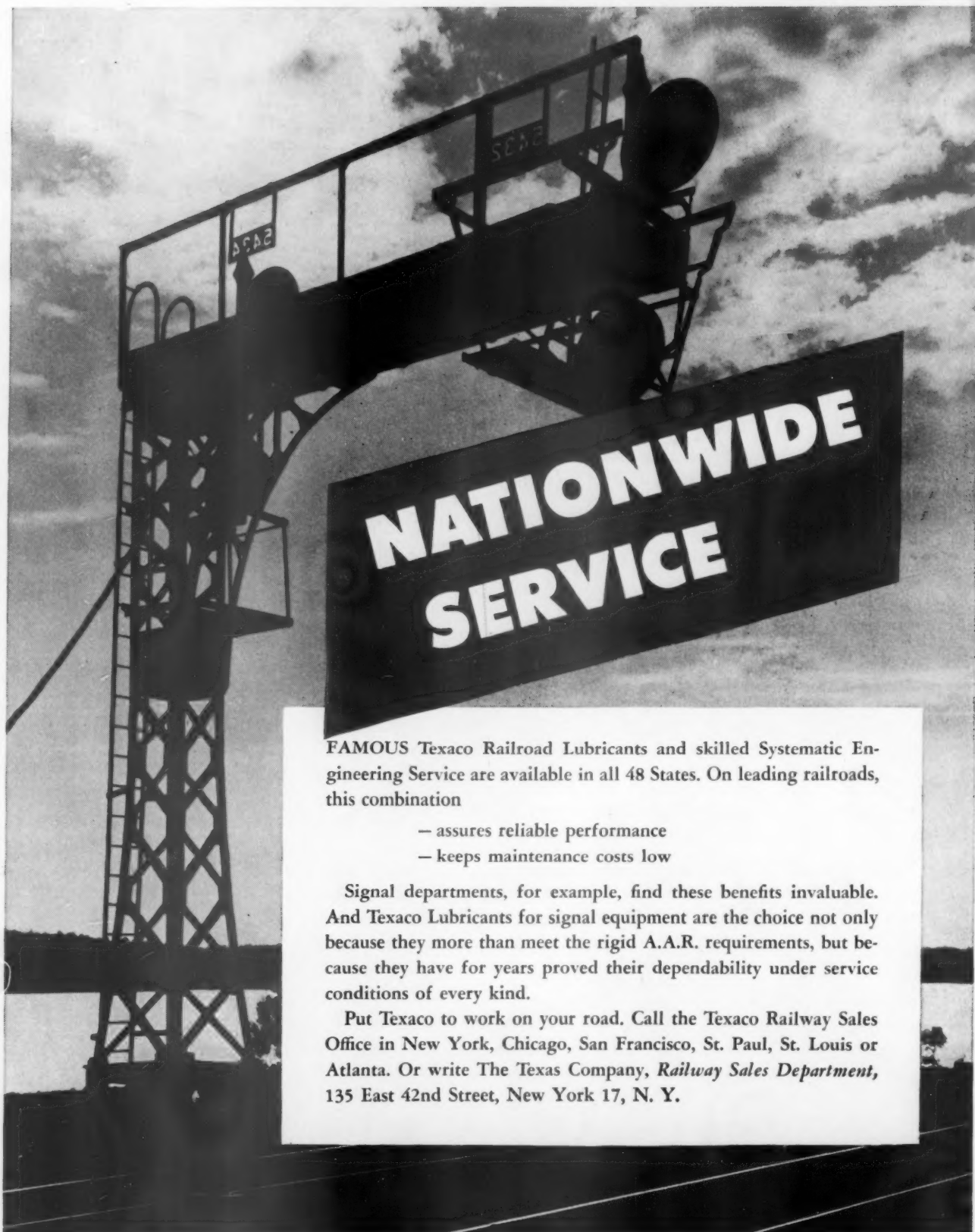
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EDITORIAL AND EXECUTIVE OFFICES AT 30 CHURCH STREET, NEW YORK 7, N. Y., AND 79 WEST MONROE STREET, CHICAGO 3, ILL. BRANCH OFFICES: 1081 NATIONAL PRESS BUILDING, WASHINGTON 4, D. C.—TERMINAL TOWER, CLEVELAND 13, OHIO.—TERMINAL SALES BUILDING, PORTLAND 5, ORE.—1127 WILSHIRE BOULEVARD, LOS ANGELES 17, CAL.—244 CALIFORNIA STREET, SAN FRANCISCO 11, CAL.—2909 MAPLE AVENUE, DALLAS 4, TEX.

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March 23, 1953

Vol. 134, No. 12

Week at a Glance

A 4-Cent-Per-Hour "Productivity" Wage Increase, estimated to cost the industry about \$120 million per year, has been awarded to nearly all railroad employees. 11

Below-Cost Rates may be imposed on the railroads by the I.C.C., says the Supreme Court, provided such rates do not cause the carriers to lose money on their over-all business. 11

The Railroads Will Spend about \$1.2 Billion of capital for improvements to road and equipment in 1953, says an I.C.C. bureau. 15

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Hauling Passengers at Freight Rates may be one reason for the general unprofitability of passenger service; the situation might be improved by reducing dead-weight per passenger. 64

Passengers Are Friendlier toward railroads, according to a survey recently conducted by the Southern Pacific. 64

Hot Box Research, to find the cause and cure for burned off journals, has resulted in an alternate A.A.R. standard for plain bearings—the iron-back bearing developed by J. J. Laudig of the DL&W. 65

Diesel Cars Are Opening a New Era in railroad passenger transportation, according to users' figures, which show that passenger appeal, plus economical and reli-

Highballing on the MP

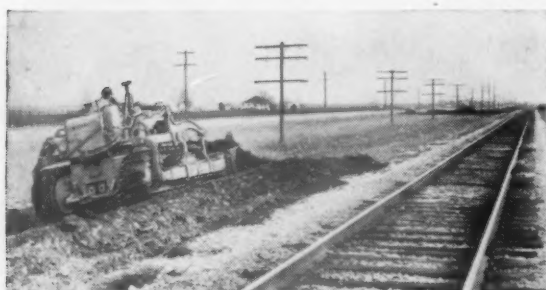


HIGHBALL FOR "THE EAGLE." International TD-14A operator gives the train crew a wave as the "pride of the line" sweeps by.

International power helps the Missouri Pacific deliver a smoother ride for passengers and freight in MP's continuous program of line improvements and year-round maintenance



"EASY RIDING TRACTOR," says operator C. J. Miller.



PROGRAM OF LINE IMPROVEMENTS along tracks of the International Great Northern, MP's Texas subsidiary, call for improved embankments, replacement of 90-pound rail with 115-pound rail.

All through the southwest, the progressive Missouri Pacific sets the pace for modern high speed railroad operations.

This calls for a continuous program of line improvements and year-round maintenance, to combine speed with a smooth ride for passengers and freight.

That's where International power comes in. And the MP not only gets faster maintenance at lower cost—they get employee satisfaction, too. Listen:

"I've been a dozer operator for the MP for eight years," says C. J. Miller. "I like the way this TD-14A handles—whipping around a telephone pole, or holding a steady line just inches away from the tracks. In this work, you have to be able to look where you're going and go where you're looking. With the TD-14A, you've really got it made!"

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POWER THAT PAYS



Current Statistics

Operating revenues, one month	
1953	\$ 863,001,072
1952	867,168,709
Operating expenses, one month	
1953	\$ 661,684,045
1952	685,457,775
Taxes, one month	
1953	\$ 102,918,275
1952	100,752,067
Net railway operating income, one month	
1953	\$ 80,074,947
1952	66,178,797
Net income, estimated, one month	
1953	\$ 58,000,000
1952	42,000,000
Average price railroad stocks	
March 17, 1953	69.47
March 18, 1952	58.85
Car loadings, revenue freight	
Ten weeks, 1953	6,767,921
Ten weeks, 1952	7,185,921
Average daily freight car surplus	
March 14, 1953	74,325
March 15, 1952	8,078
Average daily freight car shortage	
March 14, 1953	1,730
March 15, 1952	2,576
Freight cars delivered	
February 1953	7,780
February 1952	7,358
Freight cars on order	
March 1, 1953	71,883
March 1, 1952	118,900
Freight cars held for repairs	
February 1, 1953	94,145
February 1, 1952	91,689
Average number of railroad employees	
Mid-February 1953	1,184,197
Mid-February 1952	1,218,016

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able performance, produce improved revenues at lower cost. **70**

Higher Speeds Are Now Possible on a 235-mile stretch of C&NW main line because of a new automatic train stop system. **73**

Diesel Power is beginning to replace steam on the Victorian Railways in Australia. **75**

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AMERICAN RAILWAY ENGINEERING ASSOCIATION

The American Railway Engineering Association met last week at Chicago for a full program of special addresses . . . **94**

and Committee Reports and recommendations. **103**

Membership in Professional Organizations is a "must" for people engaged in traffic work, Andrew H. Brown

Rail-Auto plan travelers in '52 traveled 657 million miles on trains...

...using Rent-A-Car service at destination!



Use of the Hertz-originated Rail-Auto Plan is soaring everywhere! Final compilations for 1952 by Hertz Rent-A-Car System indicate that men and women who rented cars at their rail destinations last year *actually* traveled 657 million miles on trains! They averaged 800 miles rail travel per person, round trip!

Railroads who have joined with Hertz in steadily, enthusiastically promoting car rentals at destination as a wanted, needed travel service, know that it pays... and big! Hertz, too, knows it pays, for Hertz business has grown more than 5 times since 1947, when the first great Hertz campaign was launched, and a main factor is the phenomenal public demonstration for Rail-Auto service. Greater gains can be expected in 1953... everywhere increasing numbers of vacationers and business travelers particularly, already are piling up new records in destination reservations.

... off the highways and back on the trains!

How much of this new surge of Rail-Auto traffic comprises travelers who have... not for economy as many believed, or any reason other than desire or need for a car at destination... been driving long, tiring, often hazardous miles between cities in their own cars.

Questioning of car renters at United States, Canada and Mexico stations, from the 700 Hertz stations in more than 500 cities throughout those countries, and Alaska, Cuba, Great Britain, Hawaii and Switzerland, show beyond doubt that the number of such travelers is huge. They are *new* train travelers. They are reclaimed train travelers. They are delighted with the comfort and convenience of modern train travel. They are glad to be able to step from the train to a smart new car from Hertz, to drive as their own, as long as they wish, at surprisingly low rates. All gasoline and oil, Public Liability, Property Damage, Fire and Theft Insurance and \$100.00 deductible collision protection are included in the low rate—at no extra cost. There's no finer rent-a-car service anywhere.

Every railroad man is aware that city-to-city private auto travel totals not just hundreds of millions, but *hundreds of billions* of miles yearly, and deprives the railroads of more possible revenues than any other competitor. Many leading railroads are doing something about it... is yours? All railroads *must* if the job is to be 100% effective in tapping this great reservoir of potential profits. The job must be carried forward aggressively, consistently.

Many railroads have joined Hertz in aggressive promotion of Rail-Auto service... in their own advertising, timetables, ticket office displays, and other media... and, most important, encouraging ticket agents and other personnel to talk, sell this profit-producing, goodwill-building service.



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HERTZ Rent-A-Car SYSTEM

Week at a Glance CONTINUED

told the Ohio Valley shippers' board at its 105th meeting. 116

A Practical Coal-Burning Gas-Turbine Locomotive would be "extremely attractive," especially if oil costs increase, Walter J. Tuohy said in a recent speech to Bituminous Coal Research, Inc. 118

BRIEFS

Professor Guthrie has certainly let the railroads have it—muleting them of what looks like upwards of \$120,000,000 a year (page 11). If a rate case is up, involving potentials of this magnitude, a bench of long-experienced commissioners, who get their jobs only after Presidential appointment and senatorial scrutiny, does the deciding. In a wage case of parallel importance, the entire bench consists of one lonely little professor, chosen haphazardly — the railroads and the brothers being the only witnesses. (No reflection on the professor, who doubtless acted according to his lights; but what a system for a supposedly mature people to rely on!)

How Much Railroad Passenger Capacity would this country need in case of war? James K. Knudson, D.T.A. administrator, said last week that his agency and the Defense Department are collaborating on a "requirements study" of that subject. Mr. Knudson hopes to have some results "within a month or two." Meanwhile, Colonel J. Monroe Johnson, former director of O.D.T., says this country has less passenger capacity today than the military alone used in World War II.

Opposition to That Part of the railroad industry's legislative program which proposes to amend the Interstate Commerce Act to give the I.C.C. power to override state com-

missions and order abandonment of unprofitable intrastate services, has been ordered in a resolution adopted recently by the executive committee of the National Association of Railroad & Utilities Commissioners. The resolution mentioned specifically the pending Senate bill, S.281, but condemned also "any similar legislation."

Reversal in Outlook on air line regulation by one company, American Airlines, is "implied" in a recent speech by the line's vice-president, Miss Carlene Roberts. According to "Aviation Week," the lady air line officer appeared to favor a single regulatory body for all types of carrier. Hitherto, the air lines, as a body, have screamed defiance at all suggestions of this nature.

Sometime This Week the railroads plan to file with the Interstate Commerce Commission a petition for authority to make permanent the Ex Parte 175 freight-rate increases. This was announced March 17 by chairmen of the regional traffic associations. Under the commission's present Ex Parte 175 order, the increases would expire February 28, 1954.

If Advance Reservations placed with the Chicago & Eastern Illinois are any indication, the unusually mild (for the midwest, at least) winter, has had a marked effect on the pattern of Florida vacation travel. As a general rule, March 1 marks the dividing line for winter travel toward Florida; most travel following that date is northward. But this year the C&EI has noted an unmistakable pattern to the contrary. Elmer E. Gordon, passenger traffic manager, reports that bookings for the "Dixie Flagler" are continuing to be heavier for southward travel, thus bearing out his contention that more persons are taking late vacations this year. The flow southward has constantly surpassed that of any previous season, he said, adding that travel generally on the "Flagler" has been well ahead of 1952.



The truck that gave the **HIGHBALL** to modern freight movement!

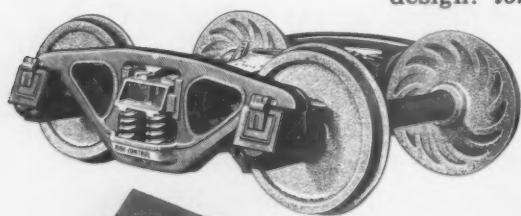
A revolution in freight handling started in 1944. Practically overnight, freight cars were built that rode safely and smoothly, at practically any speed, empty or fully loaded. *Cars that gave greater protection to lading and carried it to destination faster.*

It seems hard to believe now that all these advantages were gained so quickly by just one new concept of railroad truck design: *long spring travel with constant*

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The strongest testimonials to the performance of ASF Ride-Control Trucks come from the railroads themselves. Today, over 300,000 car sets of these trucks have been ordered—and *re-ordered*—by 174 railroads and car owners. More are specified than all other trucks combined!

More users buy more ASF Ride-Control trucks than all other trucks combined!




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Let a qualified ASF Representative show you how this modern truck can reduce your costs per car mile. Write us today.

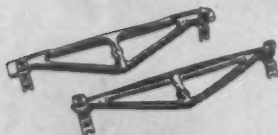


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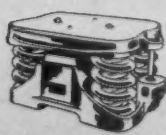
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Couplers



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Couplers

Labor & Wages

Railroaders Get 4-Cent Raise

Referee Guthrie awards that hourly increase in "improvement-factor" case—Annual cost about \$120 million

Wage increases of four cents per hour, which will cost about \$120 million a year, have been awarded to railroad employees in the "improvement-factor" case.

The award, which is "final and binding" by stipulation of the parties, was made in a March 18 report by the referee in the case—Paul N. Guthrie. The increase will be retroactive to December 1, 1952. It will not be of the annual-increment variety sought by the unions.

The unions involved in the case were the 15 cooperating organizations representing non-operating employees, and the four train and engine service brotherhoods—Brotherhood of Railroad Trainmen, Brotherhood of Locomotive Engineers, Brotherhood of Locomotive Firemen & Enginemen, and Order of Railway Conductors. However, the award is expected to be extended to railroad employees generally.

The unions asked for six cents per hour as an annual increment factor—retroactive to effective dates of their current agreements. That would have provided a present raise of 18 cents per hour. Agreements covering the operating employees are dated October 1, 1950, so the back pay proposal there was that six cents be applied retroactively to that date, 12 cents to October 1, 1951, and 18 cents to October 1, 1952. Agreements covering "non-ops" are dated February 1, 1951, so the retroactive dates of their back pay proposal were that date, February 1, 1952, and February 1, 1953, respectively.

As the referee's report summarized the railroads' position, they opposed any award, arguing that "the annual improvement factor concept is foreign to the railroad industry and one which is ill-adapted to conditions found on the railroads." The railroads also contended that the proviso of the agreements, under which the union demands were made, was not intended to authorize improvement-factor increases unless, in the course of the agreements' term, "American workers generally" had received such increases. They insisted that this was not the case.

Mr. Guthrie's report was brief, occupying only 20 typed pages, mostly double-spaced. As he put it, he made

"no effort" to write a "general dissertation with respect to the economics of the productivity factor in wage determination." He was "sure the parties would prefer to be spared that type of discussion."

Thus he proceeded rapidly to the setting forth of the award which he said "will help maintain an equitable relationship" between the "real wages" of railroad employees and those of employees in other industries.

"In the course of a few months," Mr. Guthrie added, "the parties will have an opportunity to consider in collective bargaining the whole matter of wages where all the relevant considerations can be given attention and weighed against each other. The award

is addressed to the period of the present agreements. Therefore, it is the conclusion of the referee that an increase approximating what is sometimes looked upon as an acceptable amount for increasing real wages where similar circumstances prevail will do justice during this interim period to all parties involved."

The agreements' "improvement-factor" provisions which gave rise to the case were those which stipulated that negotiations for such an increase might be launched on or after July 1, 1952, if the government's wage stabilization policy permitted such increases. There were also provisions for appointment by the President of a referee to decide the issue if the parties disagreed.

The proceedings reached the disagreement stage last December, and former President Truman then appointed Mr. Guthrie as referee. As indicated above, the parties agreed that the referee's decision would be "final and binding, regardless of whether it is made on or after January 20, 1953," which date marked the end of the Truman Administration.

Rates & Fares

I.C.C. May Fix Below-Cost Rates

U.S. Supreme Court says this may be done in specific cases if rates as a whole yield revenues which are generally compensatory on over-all business

Non-compensatory rates may be imposed on railroads by the Interstate Commerce Commission, provided they do not have the effect of causing the carriers to lose money on their over-all business.

The United States Supreme Court so ruled in a March 16 decision in a case involving an appeal of affected railroads from a commission order prescribing maximum carload rates on fresh vegetables moving from points in Texas to various destinations throughout the country.

"So long as rates as a whole afford railroads just compensation for their over-all services to the public," the court said, "the due process clause should not be construed as a bar to the fixing of non-compensatory rates for carrying some commodities when the public interest is thereby served."

The court's decision was embodied in an opinion by Justice Black. Justice Douglas filed a dissent to which Chief

Justice Vinson subscribed, while Justice Clark did not participate. The case was No. 258, *Baltimore & Ohio, et. al v. U.S., I.C.C. and Texas Citrus and Vegetable Growers and Shippers*. The latter were complainants in the commission proceeding which was docketed as No. 30074.

Before the Supreme Court, the commission took the position that proof of "everything" alleged by the railroad appellants would not justify invalidation of its order—because a rate does not violate due process "merely because it is non-compensatory." It was on this ground that the court upheld the commission order.

In doing so, it said there had been no claim that the assailed rates "will make any one of the complaining railroads operate its entire business at a loss, or even carry all fresh vegetables at a loss." The court went on to call the challenged rates "but minor alterations" in a "vast, complex network" of

rates—adjustments which “would appear to be but normal run-of-the-mine regulations.”

Moreover, the fixing of a cheaper rate for one vegetable than for another “may well serve an important public need,” the court added. It proceeded to examine precedent decisions cited by the railroads but found them pointing up situations where condemned rates were not only non-compensatory, but “unreasonable” and “arbitrary,” too. “It would not be possible to hold that the vegetable rates here challenged are the result of unreasonable or arbitrary commission action,” the court then said.

It also considered “difficulties” which the commission has had in fixing rates on vegetables. And it concluded that there is “absolute necessity for considerable flexibility in rate making.”

The dissenting justices, on the other hand, read the record “in vain” for a clue as to justification for the commission’s action in “forcing the carriers to haul the traffic at less than cost.”

Justice Douglas’ only bow to the majority opinion was this: “Perhaps dire emergencies will arise, making it necessary . . . to compel transportation of certain commodities at less than cost. But certainly such a step should not be taken without appropriate findings showing why the confiscatory rate is a ‘reasonable’ one. . . . If we assume that the prescribed rates are confiscatory, it is . . . impossible to say on the present record that they are ‘reasonable’.”

For the commission’s decision, the dissenters had this appraisal: “The report . . . is largely a hodge-podge of statistics. . . . The commission was apparently bent on leveling down some of the rates out of Texas to make them more nearly equal to those out of California, Arizona, and New Mexico. The reasons are not disclosed.”

Canadian Rates Raised More than U.S. Charges

Increases since 1938 have raised Canadian rates 98.2 per cent, while railroads in the United States have obtained advances amounting to 78.9 per cent. The increases in revenue per ton-mile have been 43 per cent in this country and 44 per cent in Canada.

These comparisons were made by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission in its latest “Monthly Comment.” Two 1953 increases are shown for the Canadian roads—one effective January 1 and the other March 16. The latest U.S. increase was that made effective May 2, 1952, as a result of the I.C.C.’s April 11, 1952, report in the Ex Parte 175 case.

In making its comparisons, the bureau warned that the U.S. and Canadian figures were “not strictly comparable.” It explained, for example, that the U.S. percentages include allowances for exceptions to general increases, whereas the Canadian figures make no such allowances. On the

other hand, the U.S. figures assume that all intrastate rates took the interstate increases; and they make no allowance for downward readjustments to meet competition.

The figures indicate that the trend of revenue per ton-mile has been much closer to the rate-increase trend in Canada than in the United States. In the first half of 1950, Canadian roads got increases which brought their freight rates to a level 45.2 per cent above the 1938 basis. Their average revenue per ton-mile in 1950 was 45 per cent above that of 1938.

The 1950 freight rates of the U.S. roads were 57.3 per cent above those of 1938, but the average revenue per ton-mile was up only 35 per cent. In

this connection, however, the bureau noted that average revenue per ton-mile is affected not only by changes in the level of freight rates, but also by such factors as changes in composition of traffic and rate cuts to meet competition.

The influence of such factors was pointed up by Canada’s situation in 1951, when the post-1938 rate increases had amounted to 62.6 per cent, while the index of revenue per ton-mile dropped to 143 (from 1950’s 145). This decline, in the face of the general rate increase, “reflects an abnormally large movement of grain in Western Canada at statutory rates, to which no increases have been applied,” the bureau explained.

Law & Regulation

I. C. C. Likes the Wolf Report

House group gets commission views on this and other proposals—Alldredge is cool to fast-rate bill and repeal of long-and-short-haul clause

The Interstate Commerce Commission has accepted, in principle, the recommendations of the so-called Wolf report, and is giving first consideration to the selection of a general manager to act as executive officer of the commission.

Commissioner Mahaffie made this statement to the House Interstate Commerce Committee when he testified before that group on March 12.

The commissioner said the I.C.C. has asked the Bureau of the Budget to approve an estimate of funds needed to make the Wolf report effective. But, he added, changes “will take time.” The report contained recommendations for streamlining the I.C.C.

Mr. Mahaffie’s presentation was another in the series of statements made to the House committee by members of the commission. The committee is headed by Representative Wolverton, Republican of New Jersey.

I.C.C. Chairman Alldredge discussed the question of “unreasonable delays” in rate cases. His comments reflected general satisfaction with commission handling of such proceedings.

“In spite of criticism of delays and inadequacy, the general transportation system has come through the postwar years in good physical and financial condition,” he said. It still is in private hands, and possesses, in the aggregate, “the most efficient carrying capacity of any transportation system in the world.”

Proposals that the rule of rate-making be amended to give consideration to the maintenance of railroad credit “reflect a misconception of factors which are now recognized by law as

legitimate considerations in rate making,” Mr. Alldredge said.

The commission chairman added it would be a “serious mistake” not to consider the effect of rates on the movement of traffic.

Repeal of the long-and-short-haul clause of the Interstate Commerce Act drew Mr. Alldredge’s attention. He said this is a question of public policy for Congress to decide, but commented that, personally, he thought Congress was right when it added this clause to the Act. It was aimed, he said, at a specific sort of discrimination not covered elsewhere in the Act.

A proposal to give the I.C.C. authority to step in and order the abandonment of unprofitable intrastate passenger service was termed by Mr. Alldredge as another question of public policy “for Congress alone to determine.”

Passenger Deficit “Perplex”

“Personally, I would be very slow to give the I.C.C. authority to intrude its judgment over the state authorities on the question of local passenger train service,” Mr. Alldredge said.

Turning to the passenger deficit, which he called a “perplex,” the commissioner came up with a suggestion of what to do with the Railway Express Agency. The present agency contract expires next February.

Enlarge parcel post operations to get the railroads out of the “small shipments” business, Mr. Alldredge advised the committee. Then R.E.A. could be made into a “purely terminal operation.” He said the commission has had indications that it is going to be

more difficult to get a universal R.E.A. contract executed by the railroads this time than it was 25 years ago.

The chairman had no specific recommendations for cutting the passenger deficit. He said the problem must be approached "from several standpoints"—railway express, mail and commuter service as well as the need to "popularize" regular passenger service.

Commissioner Mahaffie's testimony undertook to show that while the I.C.C. may have been established to regulate the railroads as a monopoly, Congress by 1920 saw that competition among carriers could be equally harmful to the public.

Factors other than monopoly have taken on more prominence over the years, Mr. Mahaffie said. For this reason, he added, any proposal to change present regulation should receive "most careful" consideration.

Mr. Mahaffie had an "unqualified yes" to the question of whether regulation is needed to maintain competition among the different modes of transportation. In the short range, he said, unregulated competition would stimulate improved service and the application of improved techniques. In the longer term it would lead, among other things, to destruction of stable rate relationships.

Safety Problems

Commissioner Patterson reported on railroad safety problems, but did not elaborate on the I.C.C.'s latest proposal for added authority over power or train brakes (*Railway Age*, March 16, page 12). At an earlier session, Commissioner Splawn had said the commission would ask for amendment of the Safety Appliance Acts to enlarge its authority over brakes.

"The measures that are necessary for increased safety on railroads are, (1) increased appropriations, and, (2) additional legislation," Mr. Patterson said. Commenting on financial needs, he said the number of employees of the Bureau of Locomotive Inspection "has never been sufficient." The Bureau of Safety, he said, is now operating with about 90 per cent of its authorized positions filled.

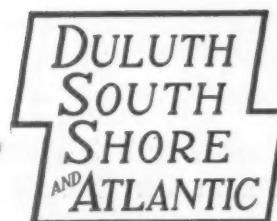
Chairman Wolverton then raised the question of charging fees for I.C.C. safety inspection work.

"It has seemed to me," he said, "that a study could and should be made as to what, if anything, could be done toward charging to the interested parties some of the expense that is incurred as a result of their business. Some attention should be given to some means of supplementing the taxpayer's burden."

Commissioner Cross, who testified on motor carrier safety, told the House committee that in 1952 vehicles of motor carriers holding operating authority from the commission were involved in accidents resulting in the death of over 2,000 persons, injury to 20,000 and property damage of \$35,000,000.



Has Given 'Way to



And . . .



Now Becomes



As . . .

Railroad Emblems Make News

Two entirely different problems have caused both the Duluth, South Shore & Atlantic and the Chicago, Milwaukee, St. Paul & Pacific to modify their long-familiar emblems. In each case the basic purpose was to avoid confusion. The remedies, however, are exactly the opposite.

The DSS&A decided to place its full company name into the pattern that formerly encompassed the road's nickname. Confusion with the very similar nicknames of the Chicago South Shore & South Bend ("South Shore Line"), and the Newburgh & South Shore (Cleveland's "South Shore Belt Line"), coupled with a growth in DSS&A trans-continental traffic, has made the change increasingly necessary, said Henry S. Mitchell, president. "Besides," he add-

ed, "the new emblem will bring wider recognition to our company's proper name."

The Milwaukee has taken just the opposite course—in keeping with the road's policy of broadening use of its nickname and limiting use of the longer corporate title to essential financial and legal matters. The simplified emblem was first proposed several years ago, but when the matter came to a show of hands, sentiment amid management for the old emblem won out—by a very slim margin. Now, however, this sentiment has given 'way to practicality and the simplified emblem has been adopted for all purposes. The term "The Milwaukee Road" is also being introduced on stationery, business cards and wherever else it can be appropriately used.

Federal Agencies Adopt New L.&D. Procedures

The Army and Air Force and the General Services Administration's Emergency Procurement Service have recently arranged to discontinue the practice of collecting their loss and damage claims by making deductions from payments on current transportation bills. The agencies will now pay the bills and file loss and damage claims as separate transactions.

In applying only to the Emergency Procurement Service, the new procedures, insofar as G.S.A. is concerned, are limited to shipments involved in collection of strategic and critical materials.

Supreme Court Will Review Case of the Lost Baggage

The Supreme Court decided last week to review a case involving a disappearing "red cap," a lady's bag and

a \$615 claim against the New York, New Haven & Hartford.

Mrs. Georgia Nothnagle lost the bag while changing trains at New Haven, Conn., on October 5, 1949. En route from Meriden, Conn., to Fall River, Mass., she entrusted her bag to a red cap between trains. The red cap disappeared along with the bag.

The lady went to court with a \$615 claim against the railroad. The New Haven argued its liability was limited because applicable tariff provisions set a \$25 ceiling on parcels handled by red caps "unless a greater value is declared in writing." Mrs. Nothnagle had not taken this precaution.

With the railroad defense resting on this tariff clause the trial court awarded the full claim to Mrs. Nothnagle. The New Haven appealed.

The Supreme Court of Errors of Connecticut upheld the trial court. It said: "The baggage while in [New Haven's] possession was not in interstate commerce . . . the baggage was left for safekeeping and [New Haven] was liable under Connecticut law as an

ordinary bailee for the actual value of the property lost."

This decision led to the road's appeal to the Supreme Court.

Foot-Mouth Disease Ban Taken Off Canadian Meat

The Department of Agriculture on March 1 removed restrictions which had been imposed, because of foot-and-mouth disease, against importation from Canada of livestock, fresh, frozen or chilled meats. The restrictions had been in effect for nearly a year.

Supreme Court Actions

The Supreme Court last week refused to disturb a ruling of the South Carolina Public Service Commission, requiring the Atlantic Coast Line and the Southern to rebuild a fire-damaged passenger station at Charleston.

At the same time the court said it would not review the Seatrain anti-trust case against seven Eastern railroads and the Association of American Railroads. This case was on appeal from the U. S. District Court in New Jersey.

The passenger-station case was brought to the Supreme Court by the ACL. This road said it would take at least \$400,000 to restore the Charleston Union Station which burned in January 1947. Both ACL and Southern have other station facilities at Charleston.

The two roads operate three interstate passenger trains a day through Charleston. When the P.S.C. ruled they must restore the Union Station they

AIR LINE WANTS UNIFIED REGULATION?

A broad attack upon the Civil Aeronautics Board, which "implied" that the present national administration might well consider abolishing it and creating a single agency to regulate all forms of transportation, was contained in a recent speech by Miss Carlene Roberts, a vice-president of American Airlines. The speech aroused particular attention because, hitherto, all the air lines have bitterly opposed the idea of unified federal regulation, and claim to want a continuation of the C.A.B.

Particular fault was found with the C.A.B. for being too liberal in promoting competition by granting route certificates, by controlling profits too severely, and by showing too much favor to non-scheduled carriers.

In reporting the speech, Aviation Week took note of the fact that stockholders of American Airlines averaged an annual return of 16 per cent on their investment during the 14 years of C.A.B. regulation.

sought relief in the state courts. The state commission was upheld.

The Interstate Commerce Commission filed a brief when the case came to the Supreme Court. The I.C.C. agreed with the state courts that I.C.C. approval was not a pre-requisite to the P.S.C. order.

In the Seatrain case, the district court judge dismissed Seatrain's com-

plaint on grounds that the I.C.C. held primary jurisdiction.

Boss' Choice of Work Plan Can Prop Negligence Claim

The United States Supreme Court has issued a ruling to the effect that a straw boss' choice of procedure for doing a job can have such connection with an employee's injury as to justify submission to a jury of a negligence allegation under the Federal Employers Liability Act.

The court's decision, announced by Justice Douglas, was in a case docketed as No. 320, *Prock Stone v. New York, Chicago & St. Louis*. It was accompanied by a dissenting expression from Justice Frankfurter with whom Justices Reed and Jackson agreed.

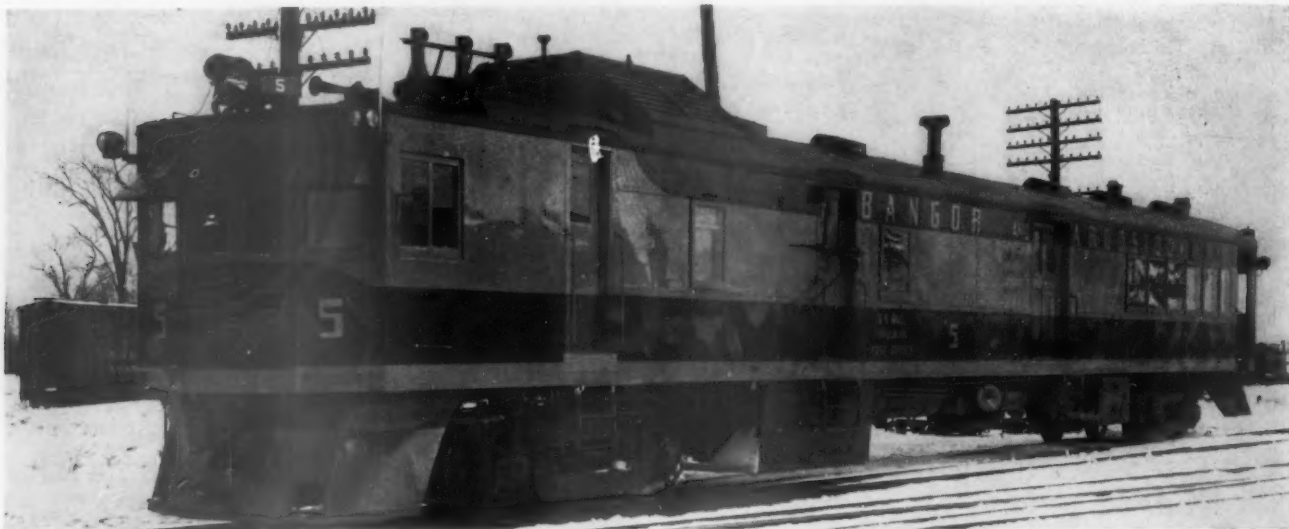
Section Crew Member

Mr. Stone injured his back while working as a member of a Nickel Plate section crew.

The crew was removing old or worn ties by a method which involved jacking up the rail, pulling the spikes, removing the plates, and then pulling out the tie.

Mr. Stone was injured while at work pulling a "stubborn" tie under orders from the "straw boss" to "pull harder" or "I will get somebody that will." Another employee was pulling, too, it being the usual practice to have two men handling the tongs. This tie, however, remained stubborn, and it finally took four men to remove it.

Mr. Stone brought suit in the Missouri courts where he won a jury verdict only to have it reversed by the



TO PROVIDE CONTINUED SERVICE—passenger, mail and express—on its 112-mile Ashland branch, between Oakfield, Me., and St. Francis, the Bangor & Aroostook has substituted this diesel-electric rail car for a former two-car train, which had been operating at a deficit of about \$50,000 per year. The diesel car was chosen as the alternative to abandoning the run completely, or substituting bus service. Abandonment, the railroad told people in com-

munities along the branch, would not have been consistent with its "sense of obligation to provide the best possible service"; while a bus "would provide first class service" for only part of the run. Therefore, the rail car, although it will not completely eliminate the deficit, was selected as the best means of providing good service for the entire branch. It seats only 22 passengers, but can haul an extra coach when necessary.

Missouri Supreme Court. The latter held that the plaintiff had not made out a case for submission to a jury, either as to negligence or causation.

In reversing that determination, the U.S. Supreme Court said that the "straw boss" could have used three other methods to remove the stubborn tie.

The question of whether or not he should have chosen one of those methods was identified as "the issue." To the court, it appeared to be "a debatable issue on which fair-minded men would differ."

The court also thought there was "evidence of a causal connection" between the "straw boss" order to "pull harder" and Mr. Stone's back injury. And that, it added, was also a matter with respect to which "fair-minded men

might likewise reach different conclusions."

In another recent determination, the U.S. Supreme Court refused to review lower-court rulings which were adverse to a section foreman's undertaking to recover under the Federal Employers Liability Act for back injuries alleged to have been received while helping lift a track car onto the track. The suit was based on contentions that the railroad was negligent in having failed to keep its track, roadbed and right-of-way in "reasonably safe" condition.

This case was docketed in the Supreme Court as No. 514, *Frizzell v. Wabash*. It came up from the Circuit Court of Appeals for the Eighth Circuit which had upheld a district court's grant of a directed verdict in favor of the railroad.

CAR SURPLUSES, SHORTAGES

Average daily freight car surpluses and shortages for the week ended March 14 were announced by the Association of American Railroads on March 19 as follows:

	Surplus	Shortage
Plain Box	7,520	898
Auto Box	127	62
Total Box	7,647	960
Gondola	6,018	121
Hopper	51,162	102
Covered Hopper ..	329	2
Stock	7,584	0
Flat	0	489
Refrigerator	1,249	26
Other	336	30
Total	74,325	1,730

Figures of the Week

1953 Outlay Seen at \$1.2 Billion

Railroad estimates indicate that their gross capital expenditures will reach that total—Final 1952 figures put total outlays at \$1 1/3 billion

Estimates submitted by Class I line-haul railroads to the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission indicate that their gross capital expenditures in 1953 will exceed \$1.2 billion.

The estimates, summarized by the bureau in the latest issue of its "Monthly Comment," were submitted by 123 of the 130 Class I line-haul roads. They put their prospective 1953 outlays at \$1,184,636,181, and the bureau noted

that the seven roads which failed to file made gross capital expenditures totaling \$47,439,757 in 1952.

The bureau also had complete returns for 1952. They showed that the 130 roads then made gross capital expenditures aggregating \$1,333,305,989. The accompanying table, reproduced from the "Comment," shows actual and estimated expenditures for the six months of 1952 and 1953, respectively, separated between road and equipment.

Actual and Estimated Gross Capital Expenditures of Class I Railways, First Six Months of 1952 and 1953

Period	Number of roads	Road	Equipment	Total	Percentage distribution	
					Road	Equipment
Actual:						
1st half 1952	130	\$176,134,697	\$539,112,792	\$715,247,489	24.6	75.4
1st half 1952*	126	170,829,051	535,172,835	706,001,886	24.2	75.8
Estimated:						
1st quarter 1953	126	83,736,671	225,045,006	308,781,677	27.1	72.9
2nd quarter 1953	126	106,877,344	247,290,607	354,167,951	30.2	69.8
1st half 1953	126	190,614,015	472,335,613	662,949,628	28.8	71.2
Per cent of change:						
1st half 1953 vs. 1st half 1952	126	+11.6	-11.7	-16.1	...	...

* Excludes figures for 4 roads which did not furnish 1953 estimates.

Post-War Unit Costs Outrun Unit Revenues

Class I railroads in the post-war period have experienced relatively greater increases in expenses per million gross ton-miles than in revenues per million gross ton-miles.

The Interstate Commerce Commis-

sion's Bureau of Transport Economics and Statistics pointed up this situation in its latest "Monthly Comment." It showed that, on the basis of 1940 as 100, the yearly indexes of revenues were "substantially higher" than those of expenses until 1945. For that year and since, the expense indexes were higher.

The 1952 revenue index was 178, its

expense index 189—both peaks for the 1945-1952 period. The revenue indexes of that period ranged down to 1946's 126; the expense indexes to 1945's 145. In the 1940-1944 period, the revenue index rose from the 1940 base to 1944's 131, the expense index meanwhile rising to 121.

Freight Car Loadings

Loadings of revenue freight in the week ended March 14 totaled 700,108 cars, the Association of American Railroads announced on March 19. This was an increase of 15,092 cars, or 2.2 per cent, compared with the previous week; a decrease of 8,867 cars, or 1.3 per cent, compared with the corresponding week last year; and a decrease of 45,020 cars, or 6 per cent, compared with the equivalent 1951 week.

Loadings of revenue freight for the week ended March 7 totaled 685,016 cars; the summary for that week, compiled by the Car Service Division, A.A.R., follows:

REVENUE FREIGHT CAR LOADINGS			
For the week ended Saturday, March 7			
District	1953	1952	1951
Eastern	127,434	129,326	138,462
Allegheny	142,328	146,732	161,736
Poconos	45,888	56,648	59,858
Southern	127,017	128,631	132,533
Northwestern ..	72,364	77,245	77,084
Central Western ..	112,755	114,400	117,447
Southwestern ..	57,230	60,130	62,382
Total Western Districts	242,349	251,775	256,913
Total All Roads	685,016	713,112	749,522
Commodities:			
Grain and grain products	41,459	46,402	50,722
Livestock	7,330	7,597	7,205
Coal	113,534	137,081	133,441
Coke	14,582	15,785	16,462
Forest products ..	42,617	43,481	43,479
Ore	19,906	20,746	20,074
Merchandise l.c.l. ..	71,462	74,018	86,549
Miscellaneous ..	374,126	368,002	391,590
March 7	685,016	713,112	749,522
February 28	668,805	755,844	785,861
February 21	589,553	683,551	734,845
February 14	681,750	737,776	740,557
February 7	690,744	733,919	573,209
Cumulative total 10 weeks	6,767,921	7,185,921	7,244,517

In Canada.—Carloadings for the seven-day period ended March 7 to-

talled 73,761 cars, compared with 71,428 cars for the previous seven-day period, according to the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
March 7, 1953	73,761	33,162
March 7, 1952	75,696	36,135
February 28, 1953 ..	71,428	32,325
February 29, 1952 ..	90,080	42,929
Cumulative Totals		
March 7, 1953	670,476	292,097
March 7, 1952	721,422	341,908

Education

List N.U. "Railroad Management" Lecturers

Northwestern University has announced the subjects and speakers for the remaining sessions of its School of Commerce course in railroad management (*Railway Age*, February 9, page 17). They are:

"Management as a Factor in Railroad Credit"—David A. Hill, consultant in railroad investments, Chicago—March 26.

"Recent Trends in Freight Yard De-

sign and Operation"—J. J. O'Toole, general manager, Chicago, Milwaukee, St. Paul & Pacific—April 2.

"Strategy of Freight Car Supply and Distribution"—J. J. Mahoney, general superintendent of transportation, Atchison, Topeka & Santa Fe—April 9.

"Railroad Engineering Research—Objectives and Methods"—G. M. Magee, director of engineering research, Association of American Railroads—April 16.

"Competition in Transportation"—J. L. Sheppard, assistant vice-president (retired), Illinois Central—April 23.

"Development of Trucks for High-Speed Freight Trains"—Charles L. Heater, vice-president, American Steel Foundries—April 30.

"Diesel and Gas Turbine Developments"—E. W. Kettering, chief engineer, General Motors Corporation—May 7.

"Planning and Pricing Railroad Passenger Service"—John S. Gallagher, Jr., transportation editor, *Railway Age*—May 14.

"Economics, Technology, and the 'Suburbanliner'" by Stanley Berge, professor of transportation, Northwestern University School of Commerce—May 21.

The 16-week lecture course was planned primarily for railroad officers and members of their staffs. Academic credit for two semester hours will be granted to those successfully completing the final examination on May 28. Details of the course have been arranged by Dr. Berge. Members of the class are using *Railway Age* as their standard text for current railway news and developments.

F.R.P. Establishes Three Fellowships

The Federation for Railway Progress has established three "Railway Progress Fellowships" for selected railroad employees to pursue a year of study at accredited universities of their own choice.

The study would be in one of the following fields: Business management and administration; traffic and transportation; labor and personnel management; accounting and finance; engineering, marketing and sales administration; and economics.

In announcing the fellowships, F. R. P. President Thomas J. Deegan said their purpose was "to promote and advance the progress of rail transportation by giving future industry leaders opportunities for university training and study of modern business and industrial methods." The fellowships will be awarded on a territorial basis, one going to each of the three districts—Eastern, Western and Southern.

Applications for the fellowships must be filed with F.R.P. by April 30, and application blanks have been supplied to all Class I roads. To be eligible, an applicant must be a regular employee of a Class I road, with at least two years' experience in the railroad industry. He must meet any requirements imposed by the university of his choice; and he must be recommended by his employer, that road also agreeing to continue paying him "at least a nominal salary" during the tenure of the fellowship.

12 Railroaders at Harvard

In the current Advanced Management Program at the Harvard Business School in Boston there are 12 participants from the railroad industry—the largest delegation from the railroads yet to attend one of these courses. The program lasts for 13 weeks and is given in the fall and spring terms. It is designed to provide information on solution of top-management problems for company officers who are regarded as likely candidates for highest company positions. (For more details on these courses, see *Railway Age*, April 9, 1951, page 38.) Two graduates of the program are now chief railway executives. The present class includes the following from the railroad industry:

Clifford B. Campbell, assistant vice-president, finance, New York, Chicago



A SILVER TROPHY for top sales performance in 1952 was presented recently to the Cincinnati branch sales organization of Fairbanks, Morse & Co. The Col. Robert H. Morse Cup, as the trophy is called, is here being presented by Col. Morse (second from right), who is chairman of the company's board of directors, to John S. King (second from left), Cincinnati branch manager. Others in the photograph are (seated): O. O. Lewis, vice-president, sales; and Robert H. Morse, Jr., F. M. president.

Standing are (left to right): Philip L. Riley (top salesman of the year for the branch, whose name was inscribed on the cup next to Mr. King's); W. B. Morse, Detroit branch manager; J. A. Cuneo, general sales manager; R. H. Morse, 3rd, general manager, Beloit works; and Henry J. Barbour, manager, sales promotion and public relations. This is the first time the cup, which has been awarded to 10 of the firm's 16 branches, was won by the Cincinnati branch.

& St. Louis; Curtiss E. Crippen, general superintendent of terminals, Chicago, Milwaukee, St. Paul & Pacific; Thomas B. Hutcheson, assistant chief engineer, Seaboard Air Line; James B. Gray, commerce assistant, New York Central; Adolph E. Kriesien, assistant vice-president and general manager, Erie; Ernest A. Larsen, manager, claim department, Railway Express Agency;

Christy G. Magruder, general freight agent, Western region, Pennsylvania; Richard G. May, assistant vice-president, New York Central; Albert S. McCann, division superintendent, Southern Pacific; Clyde A. Pearson, personnel assistant, Great Northern; Bernard S. Sines, vice-president, Texas & New Orleans; and Charles T. Williams, superintendent, Missouri-Kansas-Texas.

Operations

Diesels Carried Big 1952 Loads

Latest figures show how supplanting of steam power has continued apace in all services

Diesel-electric locomotives handled 65.52 per cent of last year's road freight service, 71.5 per cent of the passenger service, and 76.72 per cent of the yard service.

The Bureau of Transport Economics and Statistics of the Interstate Commerce Commission so reported in its latest "Monthly Comment." The road freight service was measured by gross ton-miles, excluding locomotives; the passenger service by passenger-train car-miles; and the yard service by yard miles; and the yard service by yard switching locomotive hours. The bu-

reau's figures compared the 1952 situation with that of 1946.

The diesel-electric's 65.52-per-cent share of 1952 freight service compared with its 9.73-per-cent share in 1946. Meanwhile, the proportion handled by coal-burning steam locomotives fell from 69.55 per cent in 1946 to 25.5 per cent last year; and the proportion handled by oil-burning steam locomotives dropped from 18.6 per cent to 7.1 per cent.

In passenger service, the diesel's 1952 share of 71.5 per cent compared with its 1946 share of 15.28 per cent.

The 1946 proportions handled by coal-burning and oil-burning steam locomotives were 52.05 per cent and 26.19 per cent, respectively. In 1952, these were down, in turn, to 12.77 per cent and 9.11 per cent.

As compared with the more-than-three-fourths of the yard service, which they handled in 1952, diesel-electrics in 1946 handled 29.46 per cent of such service. Coal-burning steam locomotives performed 18.16 per cent of 1952 yard service, compared with 59.6 per cent in 1946, while the respective proportions performed by oil-burning steam locomotives were 3.86 per cent and 9.57 per cent.

The relative position of the electric locomotive changed little between 1946 and 1952. Its 1952 proportions of freight, passenger, and yard services, respectively, were 1.77 per cent, 6.62 per cent, and 1.21 per cent. Comparable 1946 figures were 2.11 per cent, 6.48 per cent, and 1.32 per cent.

The accompanying table, reproduced from the "Comment," shows for 38 large railroads (those with 1952 revenues above \$50 million) the proportions of their freight, passenger and yard operations handled by diesel-electrics in 1952, compared with 1946.

Susquehanna Raises Its Per Diem Rates

The New York, Susquehanna & Western has increased the per diem rate it will pay for foreign cars on its lines, according to Henry K. Norton, trustee. Mr. Norton said decision to raise the rate was based on the increase in maintenance costs since March 1951, when the road discontinued paying the standard rate and established its own payment schedule based on the date cars were placed in service.

Effective January 1, 1953, the new rates are \$1.33, \$1.94, \$1.94 and \$2.21, for cars placed in service, respectively, before January 1, 1945; on or after January 1, 1945, and before July 1, 1951; on all cars rebuilt since February 1, 1945, at an expense of not less than \$1,700 for material and labor alone; and on or after July 1, 1951.

Percentages of Freight, Passenger and Yard Switching Operations Handled by Diesel-Electric Locomotives*—Large Line-Haul Railways, Years 1952 and 1946

Road	Freight services ¹		Passenger service ²		Yard switching service ³	
	1952	1946	1952	1946	1952	1946
<i>Eastern district and</i>						
<i>Potomac region</i>						
Pennsylvania	59.6	0.1	51.0	0.5	73.0	2.7
New York Central	66.2	1.4	50.6	6.7	61.1	28.0
Baltimore & Ohio	58.7	6.0	64.5	41.9	64.5	18.4
Chesapeake & Ohio	52.8	..	90.5	2.2	80.6	5.3
Norfolk & Western	0.8	..	..	..	..	..
Erie	98.7	11.9	96.6	..	94.2	9.1
N.Y., C. & St. L.	2.4	..	97.1	..	77.9	12.0
N.Y., N.H. & H.	81.2	34.3	58.5	34.1	91.4	64.6
Reading	69.8	21.3	74.3	10.5	80.7	39.7
Wabash	98.4	..	96.8	6.7	91.1	34.3
Del., Lacka. & Western	98.7	24.8	85.5	0.2	83.7	50.0
Boston & Maine	98.4	70.8	86.2	21.5	88.2	49.9
Lehigh Valley	100.0	0.2	96.6	0.6	98.9	43.4
Delaware & Hudson	54.3	0.1	57.2	0.3	94.3	20.7
Grand Trunk Western	57.7	0.5	0.8	0.5	60.2	44.1
<i>Southern region</i>						
Illinois Central	2.6	..	73.0	13.1	67.4	21.4
Southern	98.2	12.7	95.8	25.8	88.2	27.9
Louisville & Nashville	61.0	..	93.7	42.4	84.5	23.9
Atlantic Coast Line	99.7	25.1	99.5	52.4	98.6	36.4
Seaboard Air Line	97.3	35.9	98.5	54.8	91.5	33.0
Gulf, Mobile & Ohio	100.0	25.5	100.0	64.9	100.0	57.3
<i>Western district</i>						
A. T. & S. F. and affiliated companies	72.7	34.4	89.4	19.2	88.6	48.2
Southern Pacific Co.	66.1	..	32.1	1.5	60.2	36.8
Union Pacific	32.9	0.1	56.8	11.1	77.3	44.0
Chic., B. & Q.	78.3	29.8	97.5	52.8	77.4	60.0
C., M., St. P. & P.	66.4	18.6	77.6	16.2	75.1	35.7
Great Northern	64.7	29.8	95.9	24.2	83.6	46.6
Missouri Pacific	79.3	11.0	84.0	10.5	75.7	23.7
Chicago & North Western	82.8	5.1	66.8	20.9	72.0	44.2
Chic., R.I. & Pacific	85.5	22.1	95.0	31.4	83.7	52.1
Northern Pacific	48.1	11.3	84.2	1.4	50.3	43.0
Texas & New Orleans	56.3	..	59.3	..	88.5	21.6
St. L.—S. F.	100.0	..	100.0	..	95.8	41.6
M-K-T Lines	99.3	0.2	99.6	..	89.7	4.0
Denver & R. G. W.	87.5	32.3	89.5	18.5	77.8	64.8
Texas & Pacific	99.7	..	100.0	..	99.9	0.8
St. L. S. W. Lines	93.0	36.2	62.4	..	92.6	68.3
Western Pacific	94.6	50.7	99.6	1.4	82.0	82.8

* Principal locomotive in train.

¹ Based on gross ton-miles of cars, contents and cabooses.

² Based on passenger train car-miles in locomotive propelled trains only.

³ Based on yard switching locomotive hours in freight and passenger services.

Postwar Improvement Cost Above Atomic Program's

American railroads have spent more on improvements alone since World War II than has been spent on the entire atomic energy program, David I. Mackie, chairman of the Eastern Railroad Presidents Conference, told the New England Council's 110th quarterly meeting at Hartford, March 20.

"To continue the analogy," he said, "the railroad expenditure of over a billion dollars annually for improvement alone is about equal to the yearly bill for new atomic plant construction. And new atomic plant construction presently accounts for almost 5 per

(Continued on page 114)

MONTH OF JANUARY 1953

Average miles operated during period	Name of Road	Operating Revenues				Maint. Way and Structures				Operating Expenses				Net from railway operation	Net railway income					
		Freight		Pass.		Total		Total		Total		Total				Railway tax accruals				
		1953	1952	1953	1952	1953	1952	1953	1952	1953	1952	1953	1952							
756	Louisiana & Arkansas.....	2,105	2,257	2,205	335	20	272	252	82	77	604	1,362	1,315	60.3	59.6	423	405	366		
4,737	Louisiana & Nashville.....	16,445	12,54	20,250	2,519	2,727	214	3,750	4,040	733	355	14,049	14,863	73.7	73.4	5,013	2,440	2,696		
945	Maine Central.....	2,595	427	433	46	360	407	72	20	776	1,670	1,810	70.3	69.8	706	326	300	296		
334	Midland Valley.....	171	163	39	45	6	16	14	5	62	131	130	76.8	80.1	40	16	13	6		
1,397	Minnesota & St. Louis.....	1,601	1,666	1,892	258	281	76	121	588	1,354	1,381	81.3	73.0	312	164	164	125	188		
3,223	Minn., St. Paul & Sault Ste. Marie.....	2,393	2,652	2,619	542	46	678	712	102	77	1,267	2,737	2,821	103.2	107.7	215	287	374		
148	Mississippi Central.....	213	217	226	41	45	2	28	30	3	15	158	162	73.0	71.8	59	24	26		
172	Missouri-Illinois.....	490	494	413	61	69	74	81	20	3	122	277	284	56.1	68.7	217	104	61		
3,242	Missouri-Kansas-Texas Lines.....	5,970	283	6,644	994	973	95	1,047	1,009	226	253	5,087	5,097	74.3	76.7	1,756	676	615		
6,935	Missouri Pacific.....	16,881	1,002	19,758	20,144	3,588	2,811	265	3,859	729	463	15,977	15,302	80.9	76.0	3,781	1,273	2,584		
1,104	International-Great Northern.....	2,865	164	3,288	3,289	716	38	548	544	104	60	2,673	2,613	81.3	79.5	615	305	301		
1,723	Gulf Coast Lines.....	3,561	87	3,879	3,953	693	38	519	533	99	84	1,171	2,790	2,692	71.9	68.0	1,089	474	406	
178	Monongahela.....	572	576	759	88	105	11	77	103	10	1	232	407	506	70.7	66.7	169	33	2	
51	Mon. & W. Va.....	205	208	219	21	23	3	77	82	18	1	76	185	212	88.8	97.3	50	56	39	
1,032	Nashville, Chatt. & St. Louis.....	2,765	183	3,259	3,309	413	527	60	496	479	128	1,138	2,301	2,418	70.6	73.1	959	470	475	
10,716	New York Central.....	47,482	11,553	67,225	71,358	9,196	10,199	904	13,812	14,819	2,349	57,293	62,143	85.2	87.1	9,932	5,251	4,471		
221	Pittsburgh & Lake Erie.....	3,966	176	4,317	473	512	1	1,121	1,241	264	73	1,442	3,341	3,533	77.4	80.7	976	695	914	
2,184	New York, Chicago & St. Louis.....	13,316	196	13,513	13,243	1,807	1,818	137	2,351	2,155	334	9,719	9,352	69.9	70.6	4,194	2,056	1,611		
1,792	New York, New Haven & Hartford.....	7,667	4,303	13,743	1,878	1,826	250	2,007	2,118	375	184	5,919	10,765	10,923	80.1	79.5	2,676	1,105	768	
21	New York Connecting.....	393	414	328	77	98	20	93	46	20	..	262	357	463	42	221	73	148		
540	New York, Ontario & Western.....	510	528	567	88	102	15	61	55	23	..	207	359	359	92.5	90.5	35	56	48	
121	New York, Susquehanna & Western.....	387	43	450	444	56	54	6	12	9	2	207	359	359	79.3	80.8	93	73	22	
2,135	Norfolk & Western.....	14,187	448	17,860	2,565	2,362	278	3,520	3,980	692	279	4,981	11,713	12,744	76.1	71.4	3,698	2,691	1,764	
620	Norfolk Southern.....	874	890	962	230	181	13	139	128	27	51	285	787	746	88.4	77.5	103	59	17	
6,881	Northern Pacific.....	11,593	647	13,348	12,253	1,938	2,237	261	2,711	3,009	411	326	5,828	11,564	12,158	86.6	99.2	1,785	1,212	836
331	Northwestern Pacific.....	827	854	717	357	297	16	114	87	4	5	210	420	769	107.7	107.4	65	60	104	
132	Oklahoma City-Ada-Mo.	71	71	99	22	19	2	13	..	..	..	61	65.9	61.0	61.0	24	9	3	..
10,069	Pennsylvania.....	62,859	14,340	85,412	10,452	11,761	1,448	19,550	19,834	2,568	1,283	36,731	71,561	75,730	83.8	86.1	13,451	6,125	5,967	
364	Pennsylvania-Reading Seashore Lines, Jan.	546	99	672	774	217	24	95	97	15	10	538	895	914	133.1	118.1	223	121	5,088	
97	Pittsburgh & Shawmut.....	172	173	184	41	23	4	58	64	9	..	45	157	151	90.9	82.1	16	42	50	
132	Pittsburgh & West Virginia.....	736	746	706	102	104	23	185	205	34	60	190	572	579	76.6	82.0	174	94	93	
1,312	Reading.....	10,159	662	11,550	1,663	1,575	268	2,290	2,310	430	155	4,294	8,813	9,145	76.3	77.4	2,738	1,413	1,289	
118	Richmond, Fredericksburg & Potomac Jan.	1,560	709	2,602	2,551	309	279	24	320	288	69	23	779	1,602	1,526	61.6	59.9	1,000	534	320
394	Rutland.....	359	21	445	516	82	80	10	81	816	14	20	216	427	456	96.1	88.4	17	23	320
264	Sacramento Northern.....	418	..	424	199	57	59	2	32	15	4	82	183	166	43.1	83.3	82	14	..	
4,601	St. Louis-San Francisco.....	9,424	545	10,777	10,163	1,611	1,676	157	1,726	470	321	3,838	8,193	8,081	76.0	83.3	2,584	1,349	1,200	
159	St. Louis, San Francisco & Texas	359	6	396	416	60	48	3	37	33	1	162	298	280	75.2	67.2	98	28	107	
1,568	St. Louis Southwestern Lines.....	5,819	27	6,045	903	626	59	605	675	103	27	162	3,520	3,429	58.4	56.3	2,514	1,427	910	
4,980	Seaboard Air Line.....	12,011	1,591	14,704	14,384	2,319	2,192	176	2,494	2,362	501	1,378	10,338	10,238	70.3	71.5	4,367	1,839	1,788	
6,392	Southern.....	20,118	1,695	23,453	2,955	3,062	237	3,959	4,199	731	436	7,455	15,728	16,633	67.1	75.2	7,726	3,912	3,185	
336	Alabama Great Southern.....	1,166	67	1,578	232	245	17	334	386	71	35	800	1,106	1,305	69.5	83.4	512	259	191	
337	Chas. & Texas Pacific, Jan.....	3,448	227	3,793	426	426	32	783	753	174	70	1,035	2,438	2,438	69.4	69.4	704	561	484	
397	Georgia Southern & Florida.....	667	103	851	770	171	166	90	71	7	9	221	515	509	64.5	66.1	336	97	75	
203	New Orleans & Northeastern.....	926	56	1,052	817	157	192	15	128	134	26	20	251	309	57.1	78.2	144	31	58	
8,113	Southern Pacific.....	37,718	3,596	44,193	40,706	5,232	4,636	437	8,783	8,391	1,645	815	16,244	33,089	32,302	79.4	79.4	11,401	5,513	3,279
4,290	Texas & New Orleans.....	11,595	621	13,022	12,492	2,098	1,796	134	1,633	1,840	86	266	4,160	8,727	8,722	67.0	69.8	4,295	1,983	1,084
152	Spokane International.....	195	1	209	209	50	71	2	25	24	8	5	61	153	172	73.1	82.3	56	77	13
944	Spokane, Portland & Seattle.....	2,177	96	2,418	2,306	416	351	45	373	346	93	33	743	1,647	1,583	68.1	68.7	771	277	457
286	Tennessee Central.....	453	6	485	460	100	100	5	65	70	20	12	147	345	365	71.2	79.4	74	23	35
8	Texas & New Orleans.....	105	..	107	81	5	..	10	10	2	1	11	33	39	30.8	48.3	74	27	69	
1,834	Texas & Pacific.....	6,381	376	7,353	6,707	938	50	1,017	1,194	248	187	2,301	4,851	4,929	66.0	73.5	2,502	1,034	1,076	
162	Texas Mexican.....	280	..	298	261	50	72	5	28	32	7	8	67	174	186	58.4	71.3	124	56	45
239	Toledo, Peoria & Western.....	616	..	627	613	108	81	6	47	47	10	49	130	363	348	57.9	56.9	264	122	93
9,824	Union Pacific.....	33,716	3,063	39,851	39,150	4,744	4,680	433	8,065	7,737	1,198	1,012	31,266	30,969	78.5	79.1	8,585	5,578	1,542	
110	Utah.....	144	..	144	227	23	21	2	47	60	9	1	51	129	202	89.9	88.8	15	11	9
611	Virginian.....	3,301	476	4,652	469	531	55	834	988	176	46	812	2,262	2,692	66.2	57.9	1,154	748	614	
2,393	Wabash.....	7,810	778	9,047	8,993	1,108	1,099	118	1,217	1,292	354	299	3,834	6,830	7,004	75.5	77.9	2,216	923	897
831	Western Maryland.....	4,236	..	4,465	701	79	93	6	118	120	30	26	286	529	580	67.3	82.7	121	119	51
1,193	Western Pacific.....	4,292	244	4,635	4,504	484	494	47	789	916	185	88	1,315	2,864	3,141	64.1	69.7	1,601	909	872
2,374	Wisconsin Central.....	4,572	42	4,961	3,760	769	704	70	637	648	129	182	1,411	3,245	3,158	70.0	84.0	1,390	702	538
1,046	Wisconsin Central.....	2,374	42	2,491	310	345	36	434	495	68	7	1,030	1,963	2,138	76.6	73.0	598	148	177	

REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)
MONTH OF JANUARY 1953

Name of Road	Average mileage operated during period	Operating Revenues				Operating Expenses				Operating Ratio				Net railway operating income			
		Freight	Pass.	Total	Total (inc. misc.)	Total	Total	Retire-ments	Deprec.	Trans-portion	Traffic	Total	Total	1952	1953	1952	1953
Akron, Canton & Youngstown..... Jan.	171	\$490	\$4,781	\$5,271	\$4,781	\$5,271	\$5,271	\$5,271	\$5,271	\$5,271	\$5,271	\$5,271	\$5,271	61.1	71.3	\$182	\$72
Albany, Canton & Youngstown..... Jan.	13,094	40,684	4,781	45,465	45,465	45,465	45,465	45,465	45,465	45,465	45,465	45,465	45,465	16,239	16,239	9,488	6,626
Albany, Canton & Youngstown..... Jan.	82	339	52	391	391	391	391	391	391	391	391	391	391	110	110	203	59
Atlanta & West Point..... Jan.	93	317	50	367	367	367	367	367	367	367	367	367	367	56	56	29	14
Western of Alabama..... Jan.	133	317	50	367	367	367	367	367	367	367	367	367	367	91	91	52	39
Atlantic & Danville..... Jan.	205	164	...	164	164	164	164	164	164	164	164	164	164	44	44	11	12
Atlantic Coast Line..... Jan.	5,379	11,715	2,442	14,157	14,157	14,157	14,157	14,157	14,157	14,157	14,157	14,157	14,157	3,092	3,092	1,550	1,147
Charleston & Western Carolina..... Jan.	343	579	1	580	580	580	580	580	580	580	580	580	580	78.1	78.1	154	80
Baltimore & Ohio..... Jan.	6,186	32,505	2,227	34,732	34,732	34,732	34,732	34,732	34,732	34,732	34,732	34,732	34,732	7,306	7,306	2,558	3,552
Staten Island Rapid Transit..... Jan.	29	211	55	266	266	266	266	266	266	266	266	266	266	18	18	37	75
Bangor & Aroostook..... Jan.	602	1,497	39	1,536	1,536	1,536	1,536	1,536	1,536	1,536	1,536	1,536	1,536	510	510	303	282
Bessemer & Lake Erie..... Jan.	213	1,501	...	1,501	1,501	1,501	1,501	1,501	1,501	1,501	1,501	1,501	1,501	289	289	64	233
Boston & Maine..... Jan.	1,679	5,667	1,006	6,673	6,673	6,673	6,673	6,673	6,673	6,673	6,673	6,673	6,673	85.2	85.2	1,240	286
Canby & Indian..... Jan.	35	135	...	135	135	135	135	135	135	135	135	135	135	15	15	63	75
Canadian Pacific Lines in Maine..... Jan.	234	759	67	826	826	826	826	826	826	826	826	826	826	261	261	32	159
Canadian Pacific Lines in Vermont..... Jan.	90	204	10	214	214	214	214	214	214	214	214	214	214	23	23	12	43
Central of Georgia..... Jan.	1,786	3,201	225	3,426	3,426	3,426	3,426	3,426	3,426	3,426	3,426	3,426	3,426	81.3	81.3	383	335
Central of New Jersey..... Jan.	617	4,497	452	4,949	4,949	4,949	4,949	4,949	4,949	4,949	4,949	4,949	4,949	960	960	464	321
Central of Pennsylvania..... Jan.	422	773	68	841	841	841	841	841	841	841	841	841	841	82.7	82.7	156	80
Chesapeake & Ohio..... Jan.	5,116	26,638	720	27,358	27,358	27,358	27,358	27,358	27,358	27,358	27,358	27,358	27,358	83.30	83.30	4,075	4,791
Chicago & Eastern Illinois..... Jan.	868	2,342	301	2,643	2,643	2,643	2,643	2,643	2,643	2,643	2,643	2,643	2,643	690	690	226	340
Chicago & Illinois Midland..... Jan.	130	571	...	571	571	571	571	571	571	571	571	571	571	57	57	38	4
Chicago & North Western..... Jan.	7,874	12,358	1,865	14,223	14,223	14,223	14,223	14,223	14,223	14,223	14,223	14,223	14,223	1,992	1,992	1,055	539
Chicago, Burlington & Quincy..... Jan.	8,867	12,351	1,639	13,990	13,990	13,990	13,990	13,990	13,990	13,990	13,990	13,990	13,990	6,865	6,865	3,662	2,800
Chicago Great Western..... Jan.	1,468	2,065	71	2,136	2,136	2,136	2,136	2,136	2,136	2,136	2,136	2,136	2,136	421	421	125	151
Chicago, Milwaukee & St. Paul..... Jan.	10,670	17,992	1,471	19,463	19,463	19,463	19,463	19,463	19,463	19,463	19,463	19,463	19,463	3,683	3,683	1,798	1,225
Chicago, Rock Island & Pacific..... Jan.	7,916	14,077	1,803	15,880	15,880	15,880	15,880	15,880	15,880	15,880	15,880	15,880	15,880	5,718	5,718	2,583	2,501
Chicago, St. Paul, Minn. & Omaha..... Jan.	1,617	2,387	197	2,584	2,584	2,584	2,584	2,584	2,584	2,584	2,584	2,584	2,584	456	456	180	62
Cincinnati..... Jan.	317	1,178	83	1,261	1,261	1,261	1,261	1,261	1,261	1,261	1,261	1,261	1,261	985	985	220	892
Colorado & Southern..... Jan.	734	1,047	132	1,179	1,179	1,179	1,179	1,179	1,179	1,179	1,179	1,179	1,179	223	223	223	110
Colorado & Denver..... Jan.	1,038	1,769	...	1,769	1,769	1,769	1,769	1,769	1,769	1,769	1,769	1,769	1,769	580	580	233	296
Colorado & Wyoming..... Jan.	40	187	...	187	187	187	187	187	187	187	187	187	187	128	128	75	50
Columbus & Greenville..... Jan.	168	169	...	169	169	169	169	169	169	169	169	169	169	51	51	31	28
Delaware & Hudson..... Jan.	793	4,054	188	4,242	4,242	4,242	4,242	4,242	4,242	4,242	4,242	4,242	4,242	1,009	1,009	399	707
Delaware, Lackawanna & Western..... Jan.	962	5,845	858	6,703	6,703	6,703	6,703	6,703	6,703	6,703	6,703	6,703	6,703	1,654	1,654	849	803
Denver & Rio Grande Western..... Jan.	2,333	6,281	287	6,568	6,568	6,568	6,568	6,568	6,568	6,568	6,568	6,568	6,568	2,634	2,634	1,343	1,152
Detroit & Mackinac..... Jan.	232	144	...	144	144	144	144	144	144	144	144	144	144	32	32	22	15
Detroit & Toledo Shore Line..... Jan.	50	754	...	754	754	754	754	754	754	754	754	754	754	41	41	160	133
Detroit, Toledo & Ironmont..... Jan.	464	1,809	...	1,809	1,809	1,809	1,809	1,809	1,809	1,809	1,809	1,809	1,809	620	620	24	243
Duluth, Missabe & Iron Range..... Jan.	567	350	...	350	350	350	350	350	350	350	350	350	350	615.5	615.5	107	1,693
Duluth, South Shore & Atlantic..... Jan.	539	610	8	618	618	618	618	618	618	618	618	618	618	173	173	29	121
Duluth, Winnipeg & Pacific..... Jan.	175	374	1	375	375	375	375	375	375	375	375	375	375	34	34	32	112
Elgin, Joliet & Eastern..... Jan.	236	4,028	...	4,028	4,028	4,028	4,028	4,028	4,028	4,028	4,028	4,028	4,028	1,817	1,817	927	435
Florida East Coast..... Jan.	2,237	13,049	664	13,713	13,713	13,713	13,713	13,713	13,713	13,713	13,713	13,713	13,713	4,023	4,023	1,803	1,745
Florida Railroad..... Jan.	571	2,288	974	3,262	3,262	3,262	3,262	3,262	3,262	3,262	3,262	3,262	3,262	1,138	1,138	403	570
Georgia Railroad..... Jan.	321	711	25	736	736	736	736	736	736	736	736	736	736	134	134	37	105
Georgia & Florida..... Jan.	360	326	...	326	326	326	326	326	326	326	326	326	326	84.3	84.3	64	18
Grand Trunk Western..... Jan.	952	4,203	229	4,432	4,432	4,432	4,432	4,432	4,432	4,432	4,432	4,432	4,432	783	783	290	239
Canadian Natl. Lines in New Eng..... Jan.	172	230	...	230	230	230	230	230	230	230	230	230	230	24	24	1	72
Great Northern..... Jan.	8,303	14,277	1,023	15,300	15,300	15,300	15,300	15,300	15,300	15,300	15,300	15,300	15,300	1,508	1,508	1,568	418
Green Bay & Western..... Jan.	224	325	...	325	325	325	325	325	325	325	325	325	325	116	116	59	39
Gulf, Mobile & Ohio..... Jan.	2,766	6,871	449	7,320	7,320	7,320	7,320	7,320	7,320	7,320	7,320	7,320	7,320	2,373	2,373	1,079	910
Illinois Central..... Jan.	6,539	20,104	1,930	22,034	22,034	22,034	22,034	22,034	22,034	22,034	22,034	22,034	22,034	6,008	6,008	3,372	2,206
Illinois Terminal..... Jan.	347	1,447	...	1,447	1,447	1,447	1,447	1,447	1,447	1,447	1,447	1,447	1,447	86	86	15	92
Kansas City Southern..... Jan.	891	3,652	156	3,808	3,808	3,808	3,808	3,808	3,808	3,808	3,808	3,808	3,808	2,014	2,014	994	732
Kansas, Oklahoma & Gulf..... Jan.	337	577	...	577	577	577	577	577	577	577	577	577	577	304	304	144	122
Lake Superior & Ishpeming..... Jan.	156	55	...	55	55	55	55	55	55	55	55	55	55	107	107	30	125
Lehigh & Hudson River..... Jan.	96	269	...	269	269	269	269	269	269	269	269	269	269	90	90	34	30
Lehigh & New England..... Jan.	180	581	...	581	581	581	581	581	581	581	581	581	581	78	78	54	74
Lehigh Valley..... Jan.	1,214	5,496	344	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	1,517	1,517	615	806
Long Island..... Jan.	365	1,064	2,991	4,055	4,055	4,055	4,055	4,055	4,055	4,055	4,055	4,055	4,055	123.3	123.3	500	560

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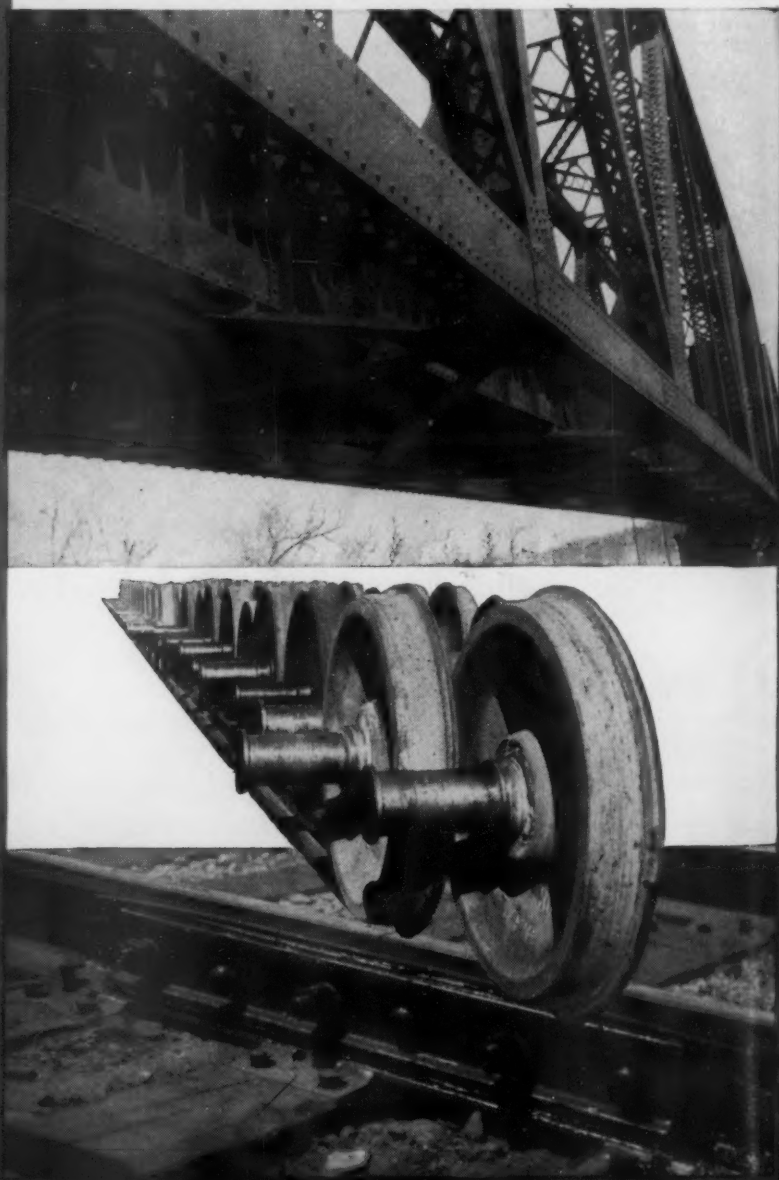
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Dearborn provides a complete line of Interior Cleaners for diesel locomotives, passenger and baggage cars, roundhouses, stations, and offices. Whatever your cleaning requirements, you'll find a Dearborn cleaner specifically designed to handle the job safely and economically.



with NO-OX-ID's

For years leading railroads have relied on Dearborn NO-OX-ID's to protect surfaces of their valuable equipment against destruction by corrosion. Bridges, car journals, rail joints—all surfaces subjected to moisture, brine, live coal, cinders and locomotive gases need positive NO-OX-ID protection to stop metal loss and reduce maintenance costs.



DEARBORN CHEMICAL COMPANY
MERCHANDISE MART PLAZA • CHICAGO 54, ILLINOIS

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RBORN

on the RAILROAD...

with Dearborn's NEW NON-CHROMATE TREATMENT

You asked for it! And it's here! Dearborn's new, *Non-Chromate* Cooling Water Treatment No. 527.

Thoroughly tested by several prominent railroads*, this new treatment provides: (1) superior protection for all metals—including *aluminum*—found in diesel cooling systems; (2) maximum safety for those who use it.

It will pay you to investigate this new Dearborn development.

**Specific data furnished on request.*

Don't Let this Happen to Valuable Diesel Parts



Improperly treated water made necessary replacement of this impeller after short service life.

Diesel Parts

Improperly treated water caused this erosion to cylinder liner after only six months' service.



FORMULA 527 FIELD TEST METHODS

Water treated with Formula 527 may be tested with Dearborn 527 Colorimetric Test Kit or Dearborn Concentrometer and Solu-Bridges.

WRITE FOR BULLETIN 5014



in de-ionizing Plants

A Dearborn De-Ionizing system, built to the requirements of your railroad, will deliver high purity water at low cost. Dearborn Zeolite plants are also available for low-cost, scale-free feed-water. These waters, plus Dearborn finishing treatments, assure trouble-free performance for steam generators, package boilers, and cooling systems.

In districts where Ion Exchange equipment has not been installed, or is not practicable, Dearborn internal treatment materials will protect diesel steam generators and package boilers against corrosion or scale formation, condition sludge, and guard steam purity.

MAIL THE COUPON FOR COMPLETE INFORMATION ON DEARBORN PRODUCTS AND SERVICES

Dearborn

TRADE MARK

COMBATting CORROSION
EVERYWHERE SINCE 1887

DEARBORN CHEMICAL COMPANY • Merchandise Mart Plaza, Chicago 54, Illinois

Dearborn Chemical Company Dept. RA
Merchandise Mart Plaza, Chicago 54, Ill.

Please send me information on:

- | | |
|--|--|
| <input type="checkbox"/> Dearborn cleaners | <input type="checkbox"/> Bulletin 5014 on Non-Chromate Treatment |
| <input type="checkbox"/> NO-OX-ID Rust Preventives | <input type="checkbox"/> Have a Dearborn Sales Engineer Call |
| <input type="checkbox"/> De-Ionizing Plants | |

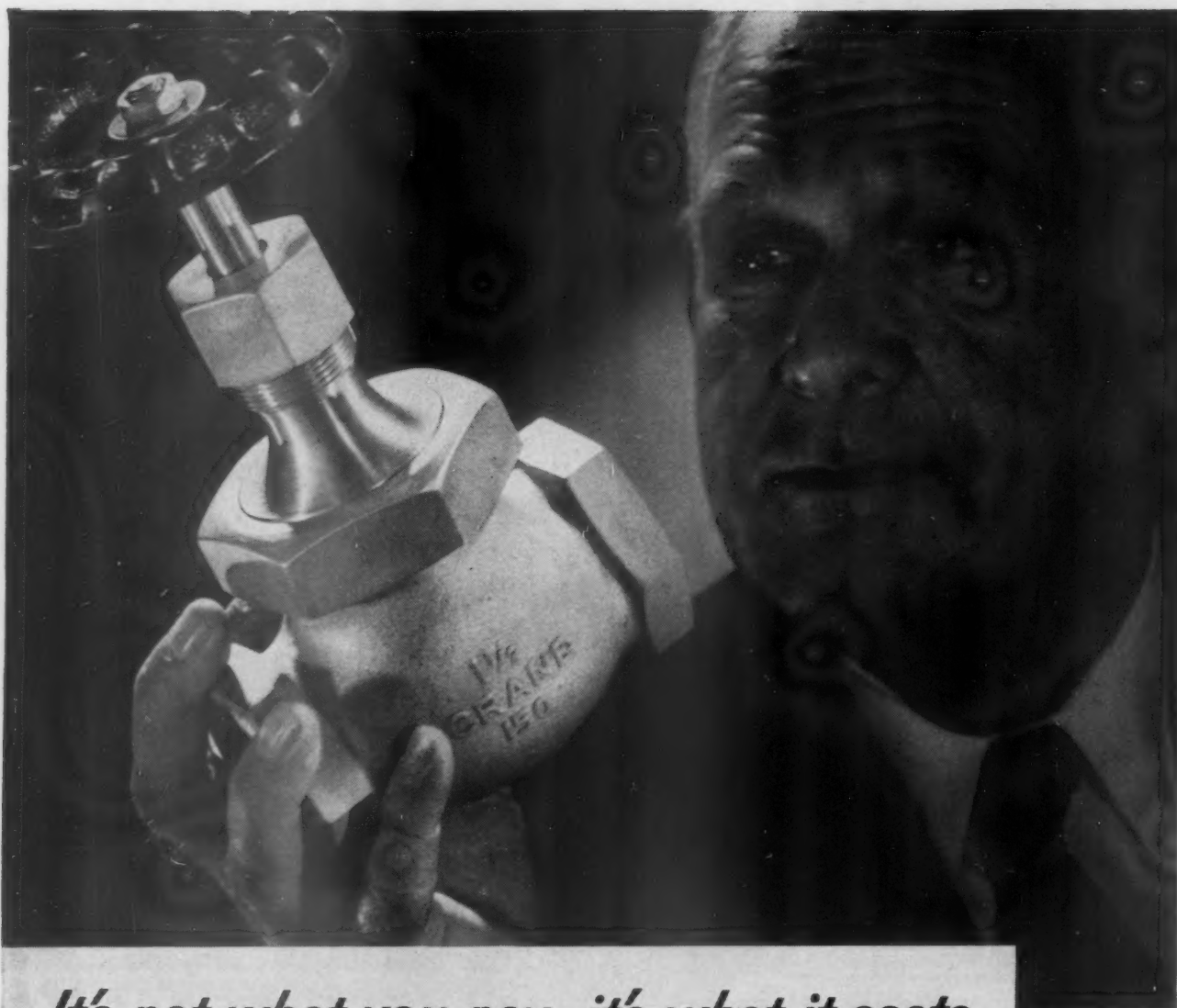
Name.....

Railroad.....

Title.....

Address.....

City.....State.....



It's not what you pay - it's what it costs

There probably isn't a thing you buy that you couldn't buy cheaper. Provided, that is, you didn't figure the real cost—provided you weren't concerned with getting your money's worth. Right?

But you are concerned. You buy for longer wear. You buy for freedom from trouble. You buy for fewer repairs . . . for more dependable service. You buy equipment to be worked—not to be laid up. You know that thrifty buying isn't merely price-tag buying.

And it's to you, the thrifty buyer, that we like to sell Crane piping equipment. Whether it's a high pressure, high alloy valve or a ½" malleable pipe fitting, every unit in the Crane line is built to last longer with fewer repairs and lower servicing costs. That's why year in and year out thrifty buyers have put more Crane Valves in service than any other make.

Crane Co., General Offices: 836 S. Michigan Ave., Chicago 5, Illinois. Branches and Wholesalers Serving All Industrial Areas.



CRANE

VALVES • FITTINGS • PIPE • PLUMBING • HEATING



A Specially Designed
OAKITE MECHANIZED
cost-cutting METHOD for safely
cleaning Roller Bearings

No danger of RUST! Completely SAFE! Saves TIME and work!
Drastically LOWERS costs! Assures THOROUGH cleaning!

YOU do the whole job **MECHANICALLY** with the Oakite Bearing-Cleaning Unit. Build it in your own shop. By employing a homogenized **OAKITE SOLVENT DETERGENT** in the equipment, you now can completely remove all lubricants and grease from journal box **ROLLER BEARINGS** in about 5 minutes. On larger bearings, such as main generator bearings on Diesel locomotives, the average cleaning time is 15 minutes.

Five Main Advantages

Here are the main advantages of this **NEW MECHANIZED Oakite**

method: (1) There is no danger of rust; (2) the **OAKITE SOLVENT DETERGENT** is **SAFE** to metals, **SAFE** to personnel; (3) You save time; (4) You drastically cut cost of doing the job; (5) Bearings are thoroughly cleaned for accurate inspection.

Find Out About This New Method Now

Let us help and work with you in setting up procedures and the economically-built equipment to handle this **ROLLER BEARING** cleaning operation on a low-cost, efficient **MECHANIZED** basis. Your inquiries invited.

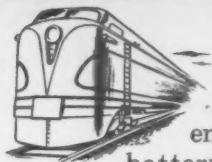
**THE OAKITE
BEARING-CLEANING
UNIT**

provides a brand **NEW**, successful method for cleaning passenger car, freight car and locomotive **ROLLER BEARINGS** on a production basis. This Oakite Unit can be constructed in your shop with readily available materials.

OAKITE PRODUCTS, INC., 46 Rector Street, New York 6, N. Y.
In Canada: Oakite Products of Canada, Ltd. 65 Front St. East, Toronto, Ont.

OAKITE RAILWAY DIVISION

INSIDE AN EXIDE-IRONCLAD



Inside... where it counts most... EXIDE-IRONCLAD is entirely different than any other battery. It's made that way by EXIDE'S exclusive IRONCLAD slotted-tube construction... a principle that provides direct operating-hour savings for you.

OF ALL BATTERIES, ONLY EXIDE-IRONCLADS HAVE POWER TUBE POSITIVES

The positive plate is different... unique... exclusive. It is the most effective retainer of active material yet demonstrated in heavy duty service. Slotted tubes contain the active material. So fine are the slots that, while permitting easy access of electrolyte, they retard the active material from washing out, hold it during repeated cycles of charge-discharge, and the vibration of rough use.

Today's battery-powered equipment is being used harder than ever before. Unless the batteries have internal shock protection they tend to deteriorate under hard usage—both electrical and mechanical. Only Exide-Ironclad has the plus-protection of the tubular positive that can withstand today's more exacting and rigorous heavy-duty battery services.

Your EXIDE sales engineer will give you the factual inside story. See for yourself why *only* an EXIDE-IRONCLAD gives maximum day-after-day service under the most difficult operating conditions... *with a minimum of maintenance expense.*

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 2

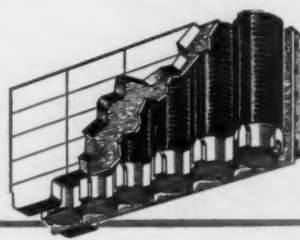
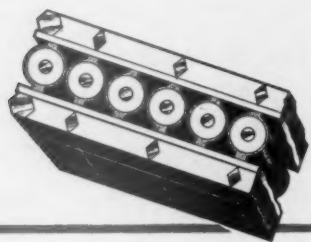
Exide Batteries of Canada, Limited, Toronto

1888... DEPENDABLE BATTERIES FOR 65 YEARS... 1953

Cross section shows relation of positive plate to separators and negative plate. Note the much greater exposure of active material to electrolyte as compared with that of the usual flat positive plate. This greater exposure makes possible the high power ability and uniform-voltage characteristics of the Exide-Ironclad. The negative plates have been made extra heavy to balance the increased capacity of the power tube positives.

Running through center of each tube is an alloy core which is cast with the heavy top cross bar. These form the sturdy, non-buckling grid. Both core and top bar are made of Exide's new corrosion-resistant Silvium, an alloy of silver, lead and other components, which adds greatly to plate's long life.

New polyethylene insulating tube sealer of acid-proof, non-corroding plastic fits snugly into bottom of slotted tubes and further reduces loss of active material. Thus more active material remains available, and the high battery capacity is maintained for a longer working life.



Exide-Ironclad

YOUR BEST POWER BUY AT ANY PRICE

You'll Find The Difference





Floor shows little wear after 3 years' hard service

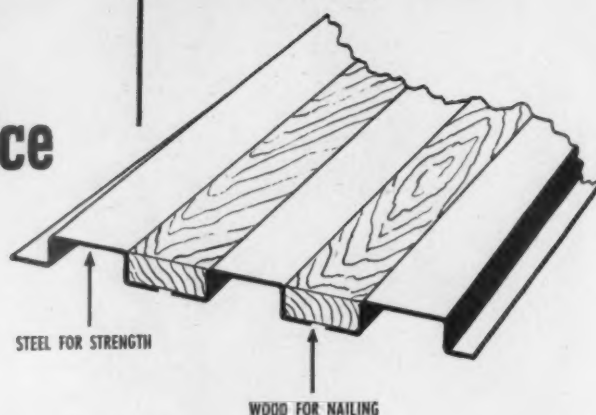
Here's what Armco Freight Car Flooring looks like after three years of hard service in a gondola. This floor was installed in May, 1949, replacing a worn-out steel plate floor. Inspection indicates that it will be many years before the wood nailing strips will have to be replaced. The steel ribs look good for the life of the car.

Steel Ribs for Strength

This composite steel and wood flooring has remained flat because the strong hat-section steel ribs are welded to side-sill angles, stringers and center sill. This gives the floor a sturdy backbone.

Wood Planks for Nailing

Spaced alternately with the steel ribs are wood nailing strips. These are solid planks 5½ inches wide that can take a nail and hold it firmly. (Steel planks are used over bolsters or cross bearers.)



Easily Installed

Armco Freight Car Flooring is designed for boxcars, gondolas and flatcars. Ribs and steel planks are supplied by Armco cut to correct length and ready for welding to the car frame. They are easily and quickly installed.

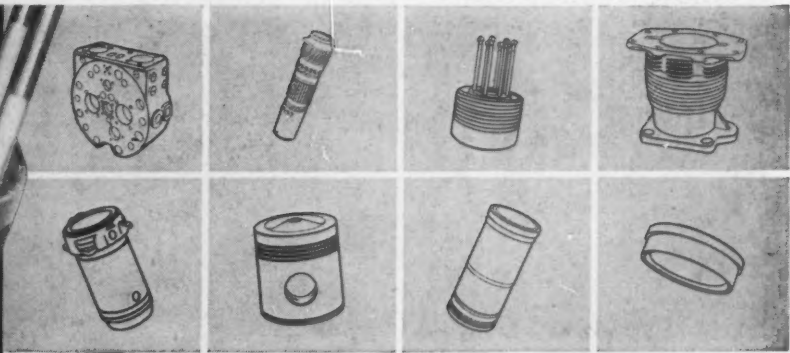
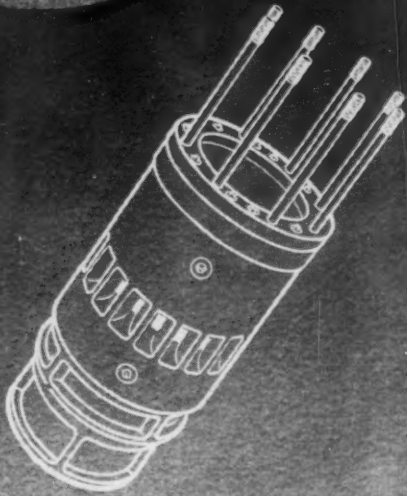
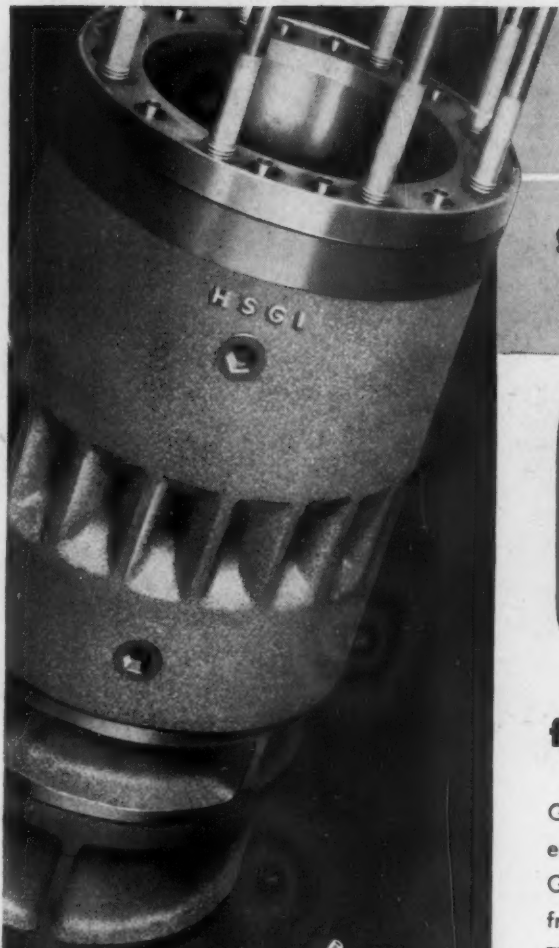
Ask us for Prices

While higher in cost than ordinary wood floors, the price of Armco Freight Car Flooring may be less than you think. If you would like to have estimates we will gladly give them to you. Just send us prints of the types of cars you plan to work on.

ARMCO STEEL CORPORATION

2163 Curtis Street, Middletown, Ohio • Export: The Armco International Corporation





GUN IRON

HUNT-SPILLER

...THE MODERN METAL for Diesel Engine Wearing Parts

Gun Iron castings, identified by the letters "HSGI", spell long, economical service for diesel engine wearing parts. Hunt-Spiller Gun Iron contains properties which provide unusual resistance to friction—extreme pressure—high heat—corrosion and erosion. These properties are recognized as vital for economical operation of diesel engine wearing parts.

The quality of Gun Iron is at all times completely controlled. It is produced in our own air furnaces, cast in our modern foundry and, when desired, the castings can be completely machined in our manufacturing plant.

Look for the letters "HSGI"—Hunt-Spiller Gun Iron—for Diesel Engine Wearing Parts.

The Civil War

The term Gun Iron dates to the founding of this company in 1810. During the Civil War at the South Boston Iron Works (opposite) two 11 inch caliber Dahlgren guns were cast for the revolving turret of the famous Union ship Monitor. It will be remembered that the Monitor and the Confederate ship Merrimac were the first ironclads to duel in the Civil War—changing the entire course of naval history. The South Boston works also made some 200 Rodman guns for the Union Army, more than half of which were of 15 inch caliber and weighed 25 tons apiece.



HUNT • SPILLER

MANUFACTURING CORPORATION

379 DORCHESTER AVENUE • SOUTH BOSTON 27, MASS.

Canadian Representatives: Joseph Robb & Co., Ltd.
4050 Namur St., Montreal 16, P. Q.

Export Agents: International Rwy. Supply Co.
30 Church Street, New York 7, N. Y.



...time does not affect
Streamlite HAIRINSUL

The installation of Streamlite HAIRINSUL into new refrigerator cars is a one time investment. *Streamlite HAIRINSUL actually outlasts the life of the car!*

It can be re-used without need for further processing. Records show where all-hair insulation, removed from refrigerator cars after 20 years or more of service, is in "like-new" condition. Its high insulating efficiency remains the same year in and year out.

In addition, Streamlite HAIRINSUL assures you all the advantages at the right—and more, too. Write for complete data.

LOW CONDUCTIVITY. Thoroughly washed and sterilized, all-hair heat barrier. Rated conductivity - .25 btu per square foot, per hour, per degree F., per inch thick.

LIGHT WEIGHT. Advanced processing methods reduce weight of STREAMLITE HAIRINSUL by 40%.

PERMANENT. Does not disintegrate when wet, resists absorption. Will not shake down, is fire-resistant and odorless.

EASY TO INSTALL. Blankets may be applied to car wall in one piece, from sill to plate and from one side door to the other. Self-supporting in wall sections between fasteners.

COMPLETE RANGE. STREAMLITE HAIRINSUL is available 1/2" to 4" thick, up to 127" wide. Stitched on 5" or 10" centers between two layers of reinforced asphalt laminated paper. Other weights and facings are available.

HIGH SALVAGE VALUE. The all-hair content does not deteriorate with age; therefore has high salvage value. No other type of insulation offers a comparable saving.

Sets The Standard By Which All Other Refrigerator Car Insulations Are Judged



Dept. H-33, Merchandise Mart, Chicago 54, Ill.



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ILWAY ACE

"UNIT EXCHANGE" IS WARRANTED

Every "Unit Exchange" assembly shipped from our eight convenient depots is warranted for 100,000 miles or one-year's service, whichever occurs first. That's the same as our warranty on new parts and components. And you pay no premium for this "performance insurance," it's a regular part of Electro-Motive's "Unit Exchange" Service. Electro-Motive's "Unit Exchange" gives you better rebuilds—faster—at lower cost.

**ELECTRO-MOTIVE DIVISION
GENERAL MOTORS**



LA GRANGE, ILLINOIS • HOME OF THE DIESEL LOCOMOTIVE

In Canada: General Motors Diesel, Ltd., London, Ontario



For handling big tonnage of metals, nothing else equals this locomotive crane

It takes more than one factor to make a metals-handling and processing plant as efficient as the fine new Max Schlossberg facilities in Chicago. Yard layout is important. Trained personnel are important. Good traffic control is important. But nothing counts more than fast, smooth, steady loading and unloading. And that's where the American 40-ton DiesELelectric Locomotive Crane shines, in the Schlossberg operation.

This company, like so many leaders among railroads, industrial plants, steel mills and scrap processing plants,

knows that the American DiesELelectric opened a whole new era in locomotive crane work. With diesel power to the deck, electric power to the wheels, the DiesELelectric can work 24 hours a day if needed, week after week and month after month. Service and maintenance expense is amazingly low.

The American line offers exactly the size and type of locomotive crane best suited to your requirements... Diesel and DiesELelectric types, capacities 25 to 80 tons. Let us help you select the model that meets your needs.

3602

Modernize...economize...with

**American Hoist
& Derrick Company**
ST. PAUL 1, MINNESOTA



For the
BIG PRODUCTION
jobs of industry...
**AMERICAN
LOCOMOTIVE
CRANES**

World's most powerful
wheel rolling mill

puts extra mileage in

**Edgewater
Wheels**

Edgewater's exclusive forging and rolling process converts heated blocks, previously sliced from ingots, into rolled steel wheels. The powerful rolling mill makes it possible to do most of the mechanical work on the rim of the wheel by a rolling action which eliminates the necessity of intermediate heating and insures the uniform fine structure essential to long service life.

E

Edgewater Steel Company

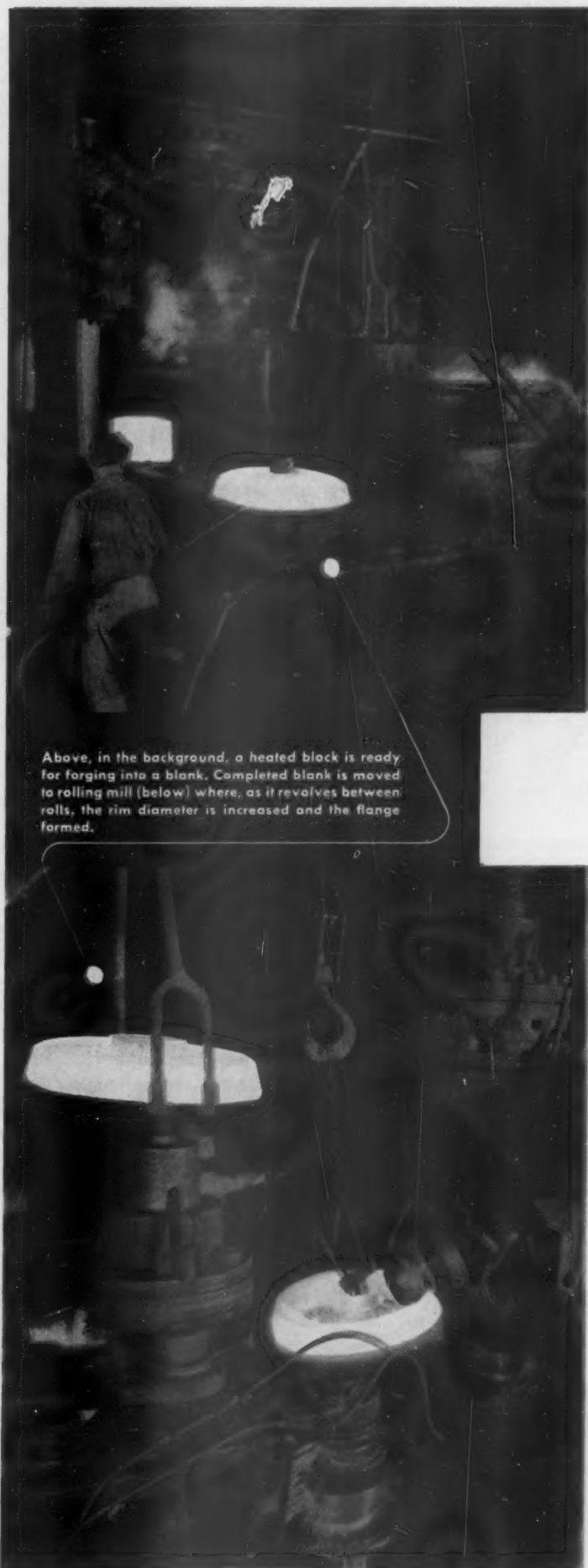
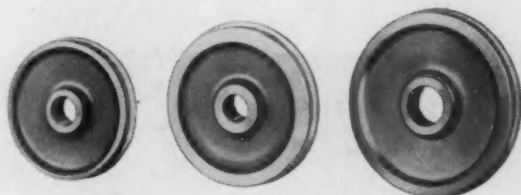
P. O. BOX 478 • PITTSBURGH 30, PA.

Makers of Rolled Steel Wheels

for Freight Cars

Passenger Cars

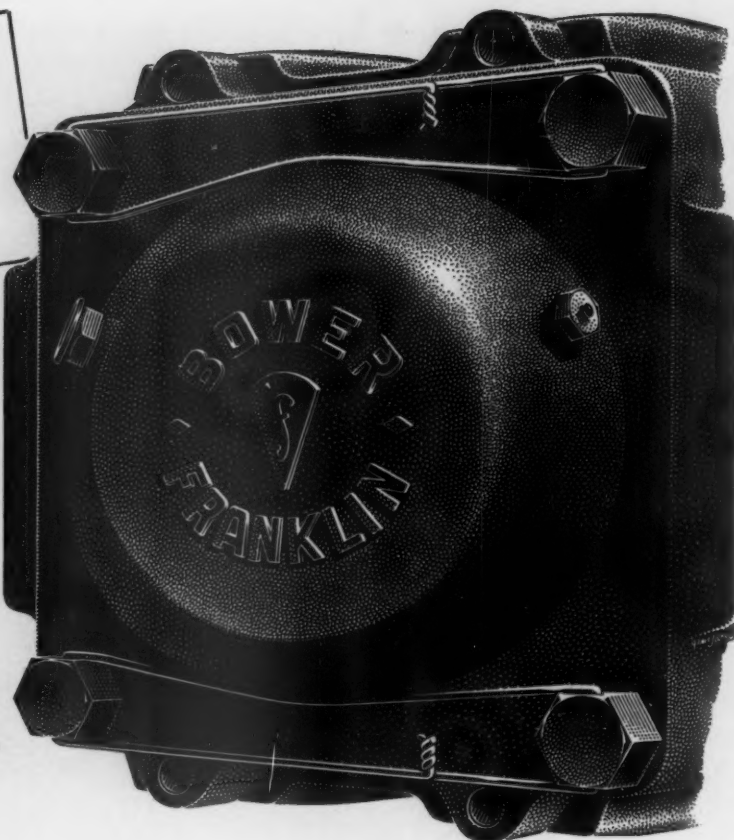
Diesel Locomotives



Above, in the background, a heated block is ready for forging into a blank. Completed blank is moved to rolling mill (below) where, as it revolves between rolls, the rim diameter is increased and the flange formed.

To be exhibited
at ATLANTIC CITY
in June

BOWER-FRANKLIN
**roller-
bearing
journal box**
for freight cars

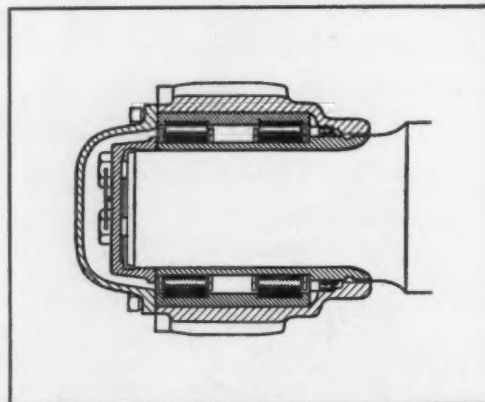


The recently announced Bower-Franklin roller bearing journal box is being manufactured by Franklin Balmar Corporation, a wholly owned subsidiary of Franklin Railway Supply Company, and the bearings are being produced by the Bower Roller Bearing Company of Detroit.

Bower is one of the largest roller bearing manufacturers, and one of the few making both straight and tapered roller bearings. As a producer of bearings for heavy earth-moving equipment and for the steel industry, it has had long experience with bearings comparable in size to those used on freight cars.

Franklin equipment has been used on every major railroad in the country. In recent years, Franklin Balmar Corporation has manufactured many thousand journal boxes for solid as well as roller bearings.

Sales and application engineering are being handled by the Franklin Balmar Corporation. Additional information will be furnished on request.



The Bower-Franklin journal box shown here is of the pedestal type. Simplicity of design is an important feature. The bearing, consisting of two rows of straight rolls running in single inner and outer races, permits free lateral. The sturdy retainer assures perfect alignment of rolls under all conditions. The housing completely surrounds and protects the bearing.



FRANKLIN BALMAR CORPORATION

WOODBERRY, BALTIMORE 11, MARYLAND

CHICAGO OFFICE: 5001 North Wolcott Ave., Chicago 40

In the Buckeye C-R Truck

THE CONTROL DEVICE IS CLEARLY VISIBLE
FROM THE SIDE OF THE TRUCK:—

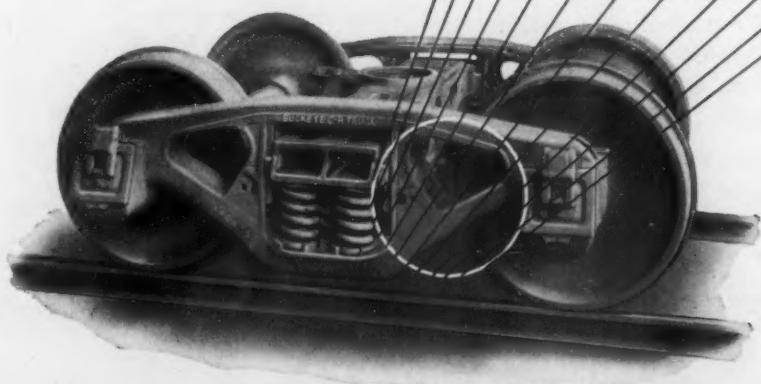
- The Condition of the Wedge Spring

and

- The Position of the Wedge

can be observed without
removing any parts.

This feature permits rapid
and frequent inspections
to determine definitely any
maintenance which may be
required for continued
proper functioning of
the control device.



THE BUCKEYE STEEL CASTINGS COMPANY

New York, N. Y.

Columbus, Ohio

Chicago, Ill.

Now!

GENERAL CHEMICAL'S

Rite-o-way*

BRAND

TCA-CHLORATE

★ **Outstanding for Control of Perennial Weeds and Grasses!**

★ **Especially Effective for Early Spring and Late Fall Applications!**



Recent AREA† tests have shown a formulation of Sodium Trichloroacetate and Sodium Chlorate to be an outstanding multi-purpose weed killer, particularly where perennial grasses are a problem. Most effective results were obtained when used for early spring and late fall applications.

General Chemical, long a leader in railroad weed control, is now producing "Rite-o-way" Brand TCA-CHLORATE especially for railroad use. It contains a *special, high-strength* formulation of Sodium Trichloroacetate and Sodium Chlorate. When applied in pre-frost and post-frost months, it provides maximum root control for perennial weeds and grasses.

Let us tell you more about General's "Rite-o-way" Brand TCA-CHLORATE formulation . . . and about the results that General Chemical's proven weed control program has achieved for leading roads. A confidential conference with a General Chemical weed control specialist will show you how to take full advantage of General's "customized" weed control program for 1953. For further information, write to the address below.

†See AREA Bulletin Vol. 54, No. 507-Feb., 1953

*General Chemical Trade-Mark

Weed Killer Department
GENERAL CHEMICAL DIVISION
 ALLIED CHEMICAL & DYE CORPORATION
 40 Rector Street, New York 6, N. Y.



Following are General Chemical's Rite-o-way Brand Weed Killers. One or more of these can provide the right combination to give outstanding weed control results for your road. Investigate today!

TCA-CHLORATE Special High Strength Formulation

Contains a special high-strength formulation of sodium trichloroacetate and sodium chlorate, now widely recognized as the outstanding all-purpose weed control material. Provides maximum root control for perennial weeds and grasses. Most effective when applied in post-frost and pre-frost months (early spring and late fall). Mid-summer treatments may be used for control of annual growth and perennial seedlings.

FORMULA 7 (TCA, Acid in an Oil Base)

For general purpose grass control. Used with diluting oil and one of the additives listed for over-all control of weeds.

FORMULA 7 (with 2,4-D)

Combines maximum contact "knock-down" of heavy foliage and residual control of root crowns, providing long-lasting suppression of regrowth. Used with diluting oil where grasses predominate, but includes sufficient 2,4-D to control moderate infestations of broad-leaved weeds.

FORMULA 7 B-D

Used with diluting oil for control of very resistant weeds and grasses. The amount of 2,4-D has been increased and fortified by pentachlorophenol.

SODIUM TCA (Liquid Concentrate)

For control of noxious grasses. For all-purpose weed control when used with sodium chlorate or one of the 2,4-D additives listed.

EMULSIBLE AROMATIC OIL

Low cost contact weed control for temporary clearance of seedling growth and as interim treatment between seasonal applications for perennial root control.

2,4-D AMINE ADDITIVE

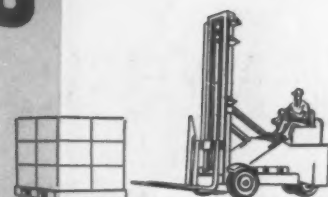
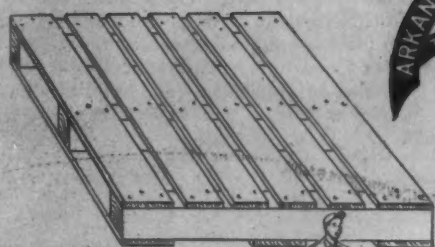
Used simultaneously with Formula 7 or mixed with Sodium TCA for all-purpose weed and grass control.

2,4-D ESTER ADDITIVE

For use with Formula 7 where cotton or other plants susceptible to 2,4-D are not adjacent to treated area.

2,4-D-2,4,5-T ESTER Brush Killer (Water Soluble)

HERCULIFT PALLETS



Step Up YOUR Shipping Efficiency - - -

Railroads throughout America have found through experience that CROSSETT HERCULIFT PALLETS are built for rugged — efficient service. There's a reason for this standard of achievement. HERCULIFT PALLETS are made from select pallet grade oak, free of defects which would impair strength, service or durability in normal use. Furthermore, Crossett offers pallets made to fit customers' specifications. Species other than oak may be specified, including elm, pecan and gum. Write at once for complete details supplied in a compact file folder.

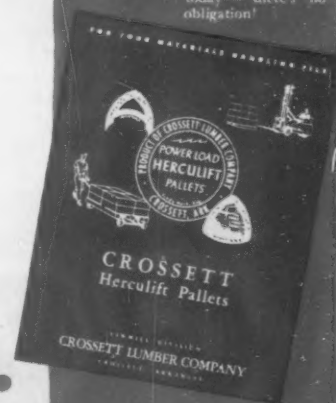
Sawmill Division

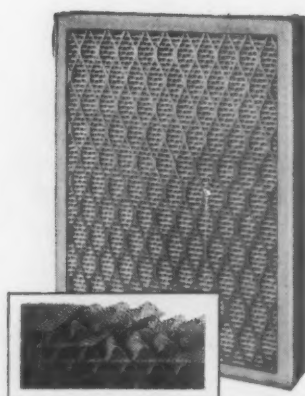
CROSSETT LUMBER CO.

C R O S S E T T , A R K A N S A S

**Send Now for
FREE Folder**

—For your Materials Handling File. This comprehensive folder tells the complete story of CROSSETT HERCULIFT PALLETS. Write today — there's no obligation!

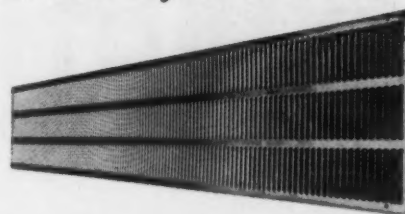




FAR-AIR Filter

Many of the major railroads in the country are standardizing on Far-Air filters for diesel locomotive and car body ventilation. Rigid field tests have proved that Far-Air's unique herringbone-crimp design and sturdy construction assure better performance under the most severe operating conditions. Filter service is less frequent because of greater dirt-holding capacity with less pressure loss.

FAR-AIR Dynamic Grille



Farr-designed equipment to eliminate foreign particles from air induction systems on moving equipment without interfering with air requirements. Practical for a number of applications and available in stainless or plain steel in a variety of sizes.

FAR-AIR*

*Air Filtration
and
Filter
Servicing
Equipment*

FAR-AIR EC-2 Unit

Engine and compressor filter assemblies available in a wide range of sizes.



Oil Eliminator

New type, high efficiency unit designed for crankcase scavenging service.

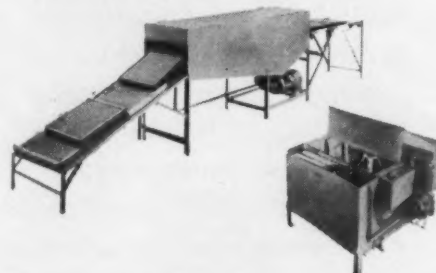


FAR-AIR Diesel Engine Assemblies

The wide variety available makes these assemblies practical for use on all types of engines. Design standardization provides interchangeability of Far-Air filters. Many major railroads use Far-Air DEA units as standard equipment.

FAR-AIR Utility Washer & Oiler

This equipment cuts filter maintenance costs, allows one-man operation, automatic control, positive oiling, and permits immediate use of filters after servicing. Catalogs available on both large and small size units.



Farr Company
P. O. Box 10187 Airport Station
Los Angeles 45, California

*Trade Mark Reg.

FARR COMPANY



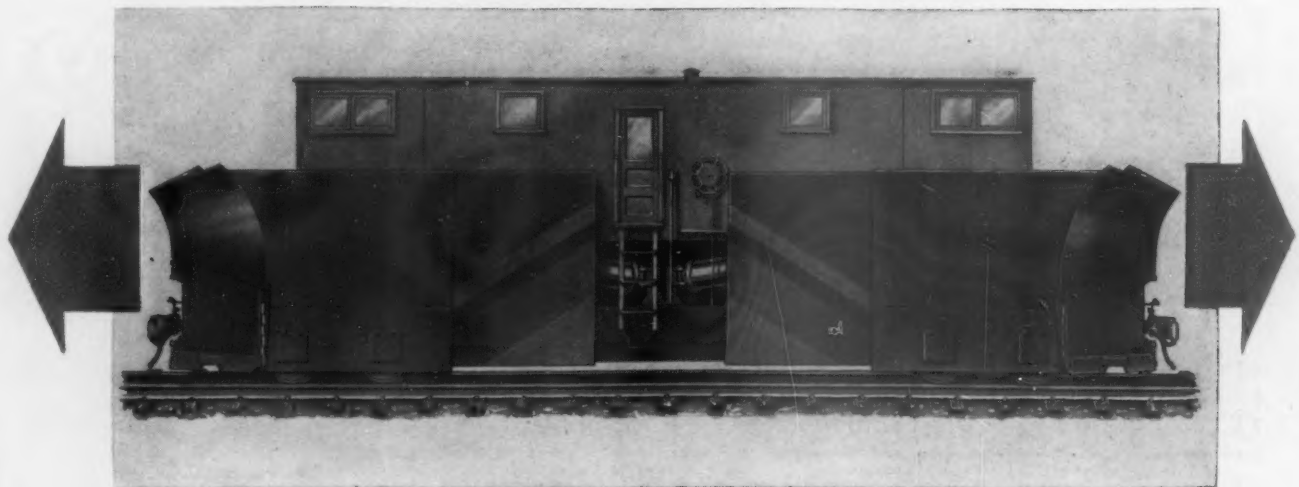
Manufacturing Engineers

Los Angeles • Chicago • New York

Mf'd under license by Control Equipment Co., Ltd., Montreal, Canada.

PLOWS BOTH WAYS

ELIMINATES COSTLY TURN-AROUND TIME!



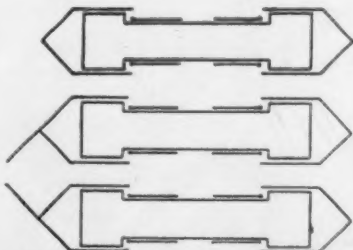
The **NEW** Jordan "TWIN-TYPE" SNOWPLOW



Front snowplow flanges even below rail tops—leaves clean rail surface for better traction.



Here's the front snowplow in travelling position—high above rail tops.



Adjustable front snowplow wings enable you to plow to both sides at once, or to a single side.



Pneumatically operated snow wings on sides of car extend way out—provide a wide path for equipment clearance.

Here is the answer to the trend away from use of turntables and similar turn-around facilities: the new Jordan "Twin-Type" Snowplow. It's double-ended . . . eliminates costly turn-around time . . . and each end has all the rugged reliability and operating features that have made Jordan snowplows famous.

- Arrow-ended welded underframe for maximum strength, even out to tip of front snowplows.
- Cab is insulated; has provision for heating if desired.
- Controls at each end of cab.
- Maximum visibility and comfort for operators.

Like to know more? . . . Use this handy coupon.

JORDAN SPREADERS • DITCHERS • SNOWPLOWS

O. F. JORDAN COMPANY • East Chicago 1, Indiana

Please send free "Twin-Type" Snowplow data.

Name & Title _____

Company _____

Address _____

City-Zone-State _____

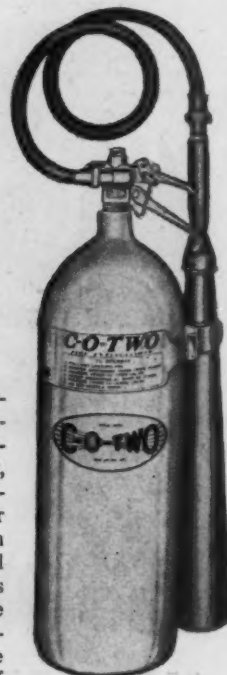


FIRE EXTINGUISHERS

*give
fast, positive
fire protection*

● Top quality backed by experienced engineering results in operating superiority at all times with the world famous C-O-TWO Squeeze-Grip Carbon Dioxide Type Fire Extinguishers as well as the newer C-O-TWO Dry Chemical Type Fire Extinguishers. Furthermore, modern manufacturing facilities and extensive field testing, together with approvals such as the Underwriters' Laboratories, Inc., Factory Mutual Laboratories and Government Bureaus assure you of fast, positive action the instant fire strikes.

**CARBON
DIOXIDE
TYPE**



With C-O-TWO Squeeze-Grip Carbon Dioxide Type Fire Extinguishers the penetrating carbon dioxide is a clean, dry, non-damaging, non-conducting inert gas... smothers fire in seconds, leaves no after fire mess... highly effective on flammable liquid and electrical fires, as well as some surface fires involving ordinary combustible materials. The C-O-TWO Squeeze-Grip Valve is the greatest single contribution to the releasing of carbon dioxide for first aid fire fighting... just squeeze lever to open... release to close.

Convenient 2½, 5, 10, 15 and 20 pound hand sizes... discharge horn non-conducting, shatterproof construction. Also, convenient 50, 75 and 100 pound wheeled sizes... available with sturdy, wide-faced wheels either with or without rubber tires, as well as available with or without discharge hose and horn protection cover.

**DRY
CHEMICAL
TYPE**



With C-O-TWO Dry Chemical Type Fire Extinguishers the heat-shielding dry chemical is a non-conducting, non-abrasive, non-toxic, finely pulverized powder compound... blankets fire instantly... exceedingly effective on flammable liquid, gas and electrical fires, as well as surface fires involving ordinary combustible materials. The exclusive inverting design renders constant free flowing dry chemical, assuring faster, more effective and complete discharge.

Convenient 4, 20 and 30 pound hand sizes... no syphon tubes or valves within the cylinder to

become clogged or inoperative... discharge hose and squeeze type discharge nozzle remain empty until actuation takes place... one piece removable top assembly. Also, convenient 150 pound wheeled size... sturdy, wide-faced wheels... discharge hose and two position discharge nozzle having soft or solid stream fully enclosed in protection casing... footrail and dual bar handle provide easy inverting.

Act now for complete free information on these fast, positive fire extinguishers. Remember fire doesn't wait... get the facts today!



MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeeze-Grip Carbon Dioxide Type Fire Extinguishers
Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide
Type Fire Extinguishing Systems
Built-In Smoke and Heat Fire Detecting Systems

C-O-TWO FIRE EQUIPMENT COMPANY NEWARK 1 • NEW JERSEY

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OF PIONEERING
AND SERVICE TO
AMERICA

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OF PIONEERING AND
SERVICE TO THE
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Listen to the RAILROAD HOUR, NBC Network, Monday Nights



Picture of Crossties *due for a longevity record !*

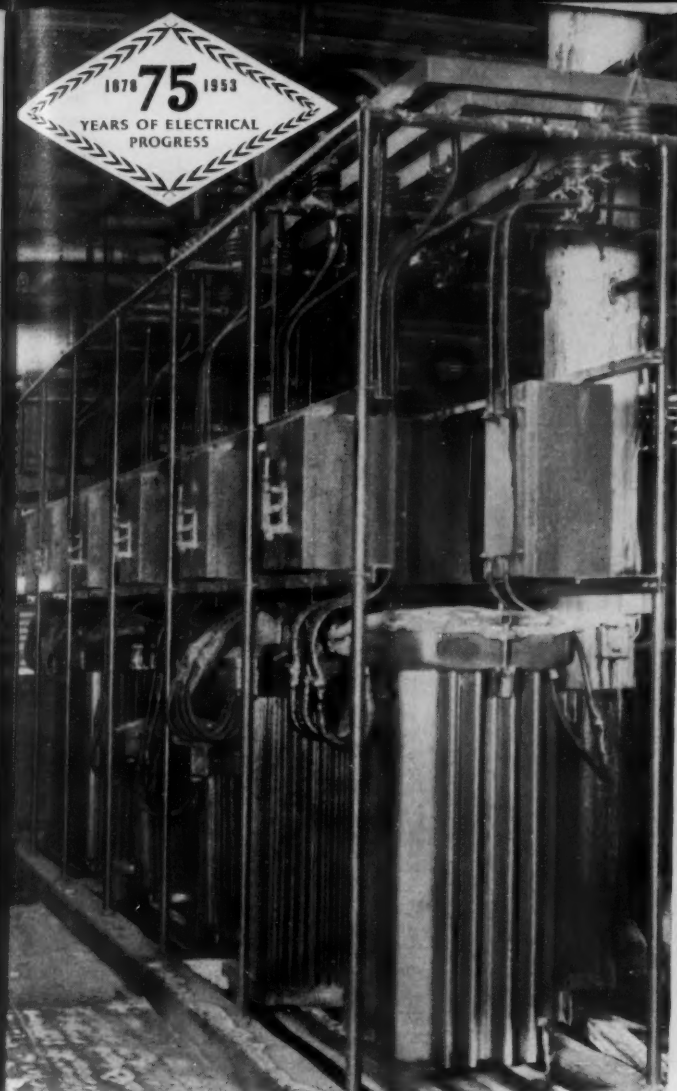
If you could actually see these nine-year old Vapor Dried ties you would agree that they are as good as they look here. Especially if you compare them to air seasoned ties, installed at the same time in the same track.

This and other control tests have convinced a lot of maintenance engineers and officials that Vapor Dried ties are largely immune to checks and splits which contribute to decay and premature tie replacement.

Yet that is only part of the story. Vapor Drying also saves you money by halving the investment in ties "on the yard." It also gives you good quality ties from so-called inferior wood varieties. And now, improvements and refinements have made the Vapor-Drying process even better and cheaper than before. Why not write today for further information? No obligation, of course.



TAYLOR-COLQUITT CO.
SPARTANBURG, SOUTH CAROLINA



G-E load-center unit substations eliminated transformers and pipe framework; saved over 400 sq. feet of valuable floor space.

Reading Terminal Meets Power Demands With G-E Load-Center Unit Substations

The Reading Terminal, Philadelphia, Pa.—To meet new, increased power demands, the modernized Reading Terminal recently installed a G-E load-center power distribution system here.

As a result, the Reading Terminal now has improved voltage control and is assured continuous service with higher interrupting capacity. Also, because no live parts are exposed, these completely metal-enclosed G-E unit substations afford more protection for employees.

Whereas power was formerly distributed to the load by heavy, low-voltage cable, high-voltage power now is brought directly to unit substations located near the load. This change alone eliminated over 25 tons of low-voltage cable from the Terminal.

Compact G-E load-center unit substations can add economy and improved service to your railroad installations. Ask your nearest G-E apparatus sales representative for details. General Electric Company, Schenectady 5, N. Y.

152-40

You can put your confidence in—

GENERAL  **ELECTRIC**

Conservatively estimated from performance record figures, VIRGINIAN RAILWAY will save \$2,200,000 on 2,500 50-ton hopper cars already built with bodies of COR-TEN, a high strength low alloy steel containing nickel.



\$avings you can be sure of getting with high strength low alloy steels containing nickel

Follow this 50-ton hopper car . . . one of 2,500 built with bodies of U-S-S COR-TEN, a high strength low alloy steel containing nickel, produced by the United States Steel Corporation.

You'll find that steels of this type can give you a three- to six-fold return on your money by reducing corrosion damage . . .

It's a fact . . . demonstrated by actual performance tests in which body sheets of COR-TEN steel and those of copper steel have been tested side by side in identical coal hauling service for 13½ years.

On the average, COR-TEN steel sheets lost only half as much weight and thickness as the copper steel sheets.

Another "identical service" test over a 13-year period confirmed the above findings. And, examinations of U-S-S COR-TEN steel hopper cars on various railroads show equivalent sub-

stantial reduction of corrosion damage.

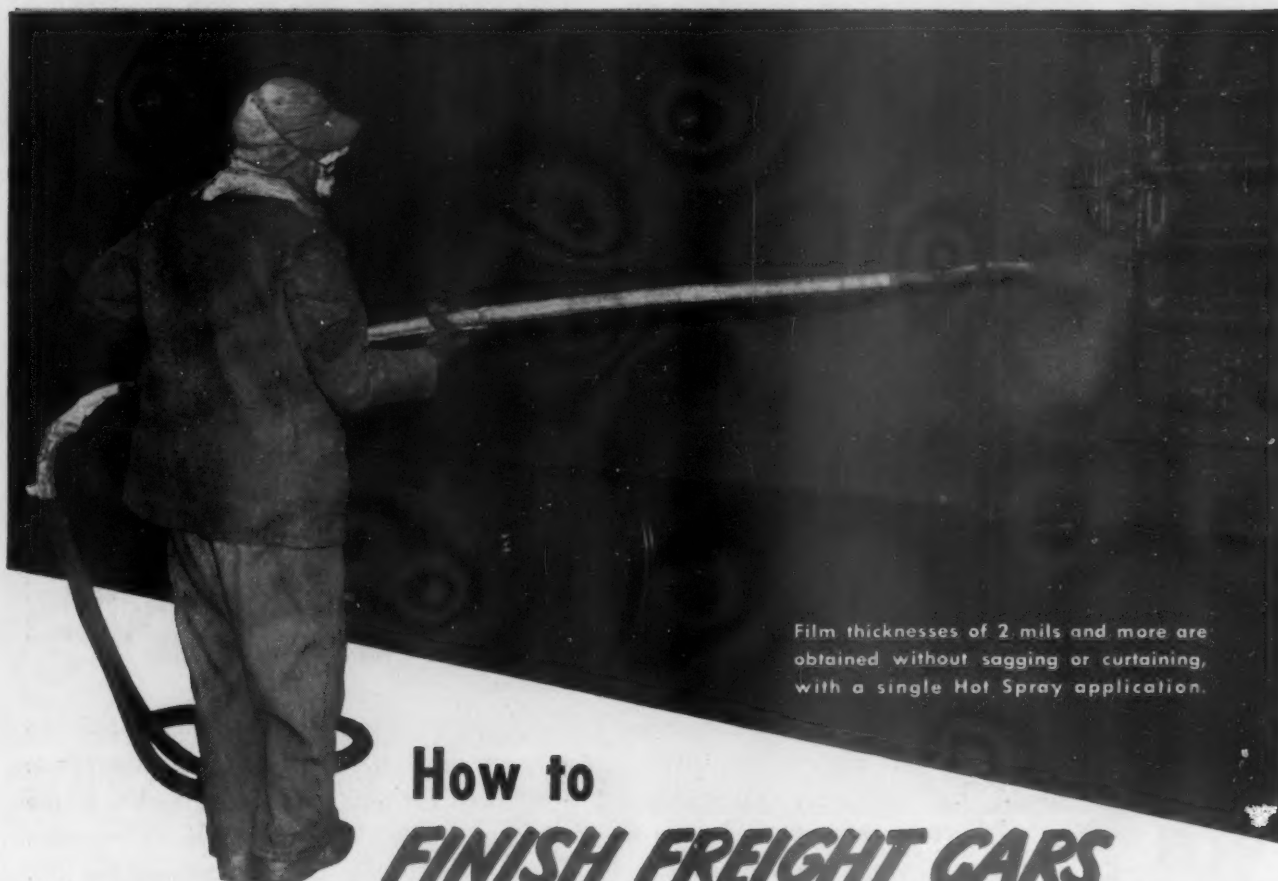
Produced under various trade names by leading steel companies, these high strength steels containing nickel along with other alloying elements, provide three basic advantages:

1. Good resistance to corrosion, abrasion and impact.
2. High strength in the as-rolled condition, permitting important weight reductions or improved factors of safety.
3. Excellent response to usual fabrication operations, including easy forming and welding.

At the present time, nickel is available for end uses in defense and defense-supporting industries. The remainder of the supply is available for some civilian applications and governmental stockpiling.



THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET
NEW YORK 5, N. Y.



Film thicknesses of 2 mils and more are obtained without sagging or curtaining, with a single Hot Spray application.

How to **FINISH FREIGHT CARS** **DOUBLE-QUICK...with "2-in-1" Hot Spray!**

Get Two-Coat Protection in One Application!

Here's the way to apply paint to freight cars—thicker, quicker. The Sherwin-Williams Hot Spray system applies twice as much finish coat material in a single application . . . reduces painting costs even more because less material is needed, less wasted in overspray.

This new system nearly doubles shop capacity. It does away with drying time between coats . . . gets cars back in service faster. In addition, it provides longer-lasting good appearance and protection through more uniform application, better adhesion and higher gloss. And it eliminates most variables caused by temperature and weather.

Hot Spray finishing for freight cars, with Sherwin-Williams Hot Spray Synthetic Freight Car Enamels, has been thoroughly field-tested in railway service by leading railways.

S-W Hot Spray Finishes are part of a complete line of S-W finishes specifically engineered for railway service. Write for new S-W Hot Spray Brochure B-760. The Sherwin-Williams Co., Transportation Division, Cleveland 1, Ohio.



Cold weather application of Sherwin-Williams Hot Spray Freight Car Enamel. Inspection showed excellent coverage, uniformity and gloss in spite of 24-32°F. weather and outdoor location.

SHERWIN-WILLIAMS
RAILWAY FINISHES





**SAFETY
KEEPS
PACE
WITH**



SERVICE ON MORE THAN 100 RAILROADS

Service improves at a fast pace on American railroads. And, with the installation of WRRS Model 10 Automatic Signals, safety doesn't lag behind. Over 100 railroads have come to depend on the Model 10 Signal to keep their routes safe. Thousands of WRRS Model 10's guard busy railroad-highway crossings, yet there is not one accident on record as a result of operation failure on the part of these signals. We think that's a real safety record.

And Model 10's save costs, too . . . the first cost of installation and the second cost of maintenance. Analyses show that numerous crossings can be made safe with Model 10 installation for less than the cost of a single grade separation. Beside initial saving, Model 10's cost little to maintain . . . there is virtually no replacement of parts with these signals on the job.

WESTERN RAILROAD SUPPLY CO.

2428 S. Ashland Ave., Chicago 8, Illinois



Model 10
AUTOMATIC GRADE CROSSING SIGNALS
PRODUCT OF
WESTERN RAILROAD SUPPLY COMPANY
CHICAGO 8, ILLINOIS



Model 10 installation on the C.R.I.&P. at 95th St., Chicago. Unusually heavy traffic (120 trains, 35,000 to 40,000 vehicles per day) give these signals the acid test for safety and efficiency. Record? Not a single fatality has occurred since installation in 1937.

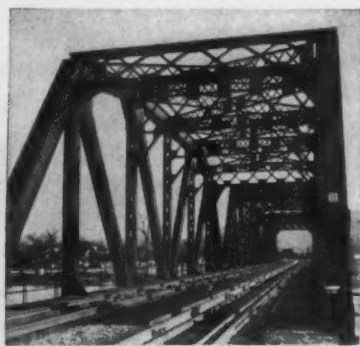
A brand new bridge in 7½ hours!



LARGE PHOTOGRAPH at top shows the new bridge on falsework alongside the old bridge. Falsework for the old bridge can be seen on the opposite side of the piers. Directly above is view of new bridge after removal of old bridge and all falsework.



NEW BRIDGE is in position on piers. Old bridge is on falsework.



CLEAR TRACK AHEAD! Job completed, the bridge is open for traffic.

The structure was designed by the Pennsylvania Railroad Company. Fabrication, erection and removal of the old span was by American Bridge.

AVAILABLE NOW! For showing in churches, schools, clubs and industries, the new sound and color motion picture—**BUILDING FOR THE NATIONS**—a candid, factual photographic record in full color of the highlights of the fabrication and erection of the United Nations' Secretariat Building in New York City.

How novel use of the "double shift" speeded erection of Pennsy's new triple-span bridge over the Allegheny River

PENNSYLVANIA RAILROAD'S new double track bridge over the Allegheny River at Warren, Pa., is another example of American Bridge ingenuity. In this case, an old bridge was replaced by a modern structure on the existing piers with a minimum of traffic interruption.

The project involved the erection of three double-track, thru truss spans, each 154'6" long and 33' c.c. of trusses, on falsework adjacent to the existing piers, simultaneously rolling the old structure off these piers onto similar falsework, and the 2,200-ton steel superstructure with its ties, rails, timbers and pipe railing into position on the original piers.

The amazing "double shift" transposition was completed—all six spans simultaneously—rails connected, and the new bridge opened for trains after a traffic interruption of only 7½ hours!

Jobs like this, and the more recent one for the Illinois Central at Cairo, explain why so many railroads rely upon the know-how, the facilities, and the experience of American Bridge to handle the most difficult construction problems.

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AMERICAN BRIDGE

UNITED STATES STEEL



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**your investment in
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GLIDDEN EXTERIOR PAINTS

Alkyd-resin, known for its extra protective qualities is now incorporated in the special Glidden exterior paints formulated for the railroad industry. These paints will make your station exteriors look bright and new and protect their value for many years.



**station interiors by
color styling with**

GLIDDEN SPRED SATIN and GLOSS

These two washable, scrubbable, durable finishes are the most practical ever made for waiting rooms and offices . . . you paint while they are in use. SPRED SATIN, the wonder wall paint, and SPRED GLOSS, the new latex base enamel, both dry in ½ hour, have no offensive odor and keep their original beauty after repeated washings.

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waybills . . . corrections,
statements, reports**

Transcopy is your answer to improved photocopying without time-consuming processing operations. This latest Remington Rand development gives railroads, in seconds, a finished, photo-exact, positive copy of any office or operating record regardless of type or color. Originals can be up to 14" wide in any length. Anyone can do the job without previous photographic experience. Portagraph Transcopy operates anywhere . . . whenever photocopying is needed — a companion unit for Portagraph or any other properly designed contact printer.

Here's How Transcopy Works

Place the record to be copied face to face with a sheet of Transcopy negative paper and expose. Remove them from the printer and place the exposed negative paper with a sheet of Transcopy positive paper in the front slots of the Portagraph Transcopy unit. In about ten seconds, these two sheets will emerge from the rear slot of the Transcopy, in contact with each other. When separated, you have a perfect positive copy ready for immediate use.

*Transcopy
makes photocopying
a pleasure*



- NO CHEMICAL TRAYS • NO WET HANDS
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Gentlemen:

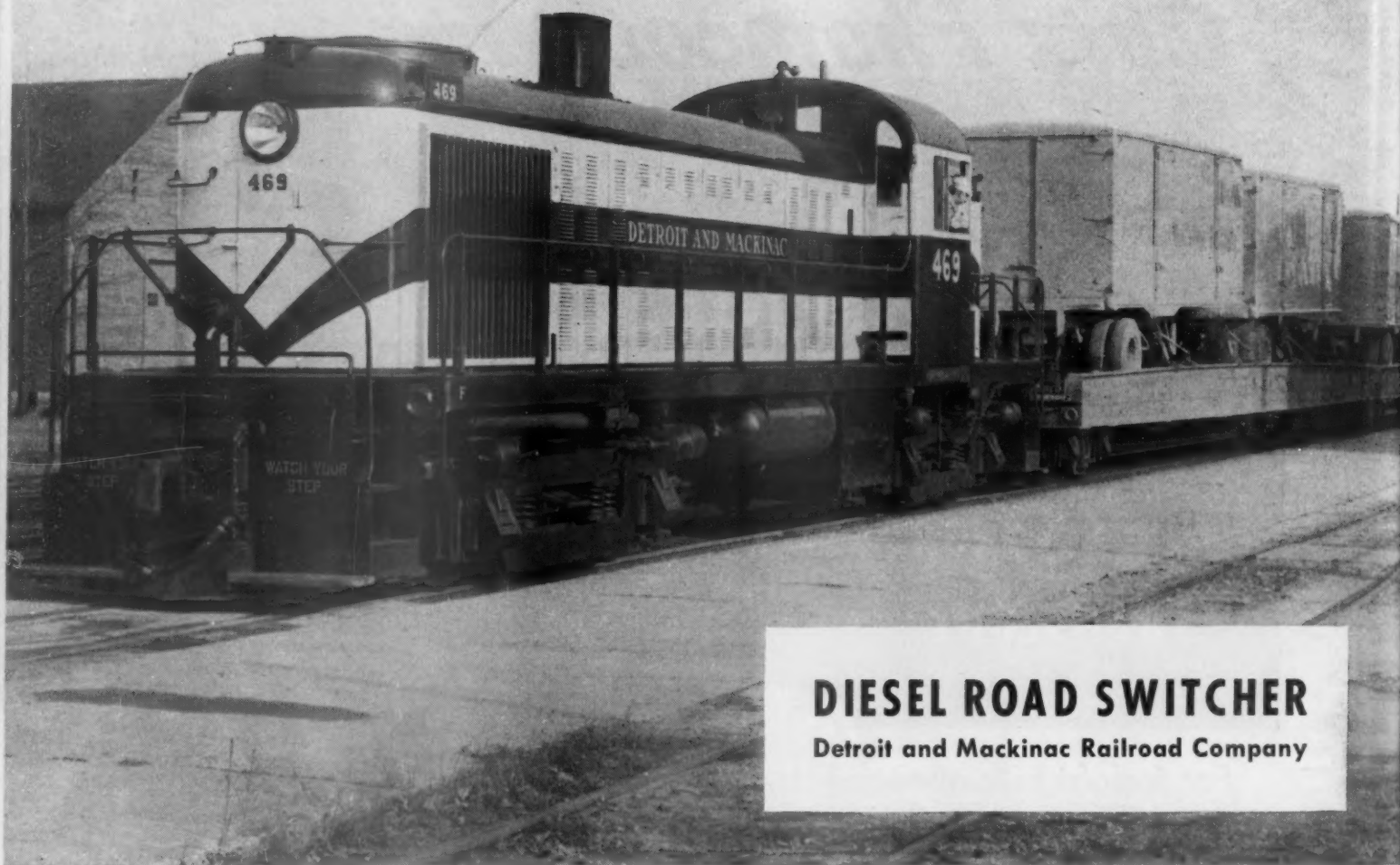
I want to know more about the savings in photocopy time possible with Portagraph Transcopy. Please send me, without obligation, free booklet P-334 describing in greater detail this great new unit.

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DIESEL ROAD SWITCHER

Detroit and Mackinac Railroad Company

Hard-working road switchers on the Detroit and Mackinac railroad use...

● Alco-G.E. 1500 h.p. road switchers keep tonnage freights rolling on schedule over the Detroit and Mackinac railroad in northeastern Michigan. In this tough service, STANDARD HD Oil has supplied effective lubrication for these units. Used for over five years, it has given ample evidence of its ability to help keep maintenance costs low and availability high.

STANDARD HD is now used by over 70 railroads for all types of diesel service. Make this acceptance your basis for investigating the benefits offered by this superior heavy-duty lubricant. A Standard Oil Railway Department representative, through his ex-

STANDARD HD
TRADE MARK
Oil

tensive experience, can help you obtain more effective lubrication. For his services, write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY



(Indiana)



Don't put off any longer your plans for Atlantic City in June

You should by all means come to Atlantic City for the R.S.M.A. Exhibit Convention this June. And if you are coming, you should make your hotel reservations without delay. Advanced reservations are running well ahead of 1947.

If you are a manufacturer of products sold to railroads, you should also plan to exhibit. Available space is scarce, but there is still some left. Applications should be mailed—or wired—to the Railway Supply Manufacturers Association, 60 East 42nd Street, New York 17, N. Y. attention Mr. A. W. Brown, Sec.-Treas.

The dates:

June 22nd through June 27th

The place:

Convention Hall in Atlantic City

The meetings:

Mechanical Division, Purchases and Stores Division, and the Electrical Section of the

Engineering and Mechanical Divisions of the Association of American Railroads.

The Exhibits:

In Convention Hall and on the track, the finest that have ever been held, showing hundreds of the new developments since the 1947 Convention.

Attendance:

Advance figures indicate that the largest group of American railroad men ever to attend an Atlantic City Convention will be on hand.

Pan American Railway Congress:

The Pan American Railway Congress is adjourning its meeting in Washington, D. C., for this Convention. Members are coming to Atlantic City by special train on June 21st.

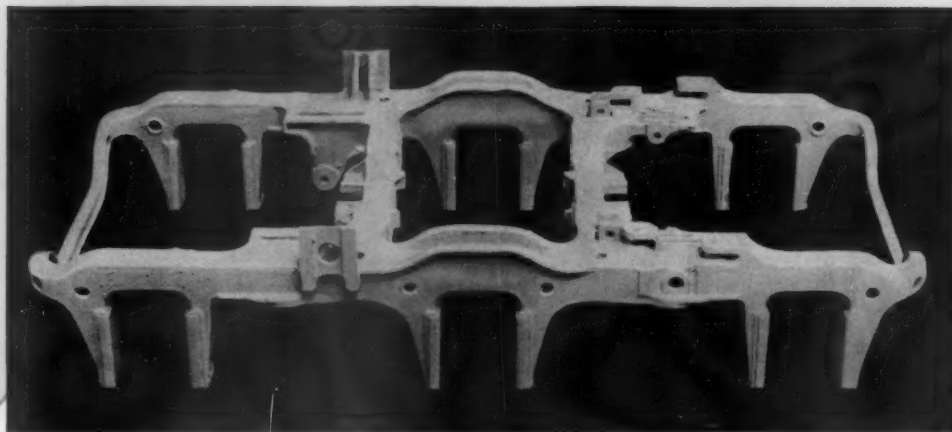
You would long regret not attending so be sure and come to Atlantic City in June. Make your plans—and your room reservations—**now**, before it is too late!

The Railway Supply Manufacturers Association

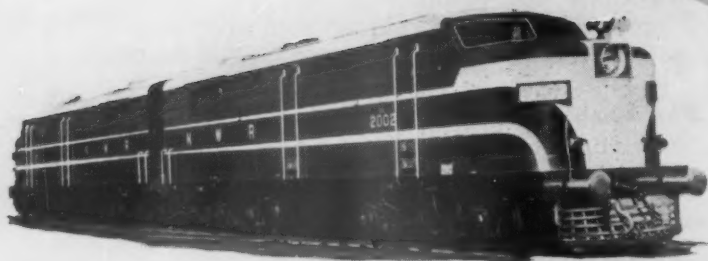
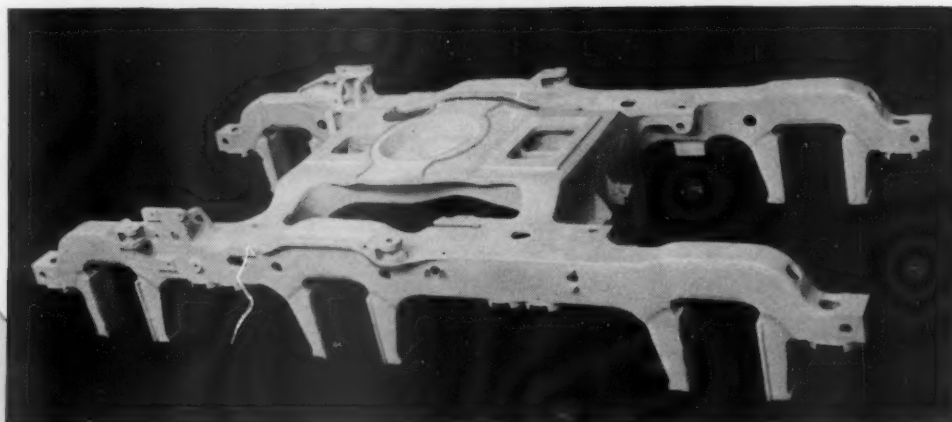
COMMONWEALTH

DIESEL LOCOMOTIVE TRUCKS.....

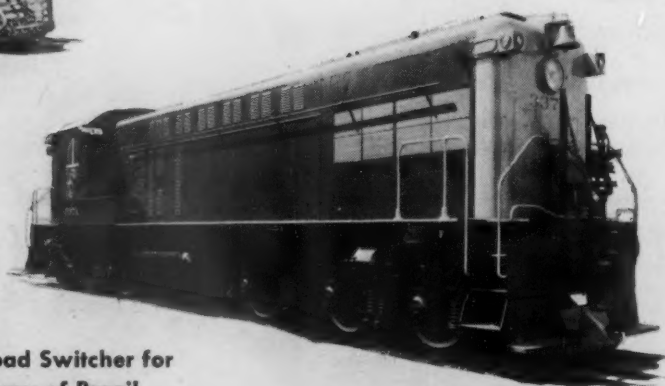
**Commonwealth
Motor Truck Frame
(2 motor type)**



**Commonwealth
Motor Truck Frame
(3 motor type)**



**3200 H.P. Freight and Passenger Locomotive
for North-Western State Railway, Pakistan**



**1600 H.P. Road Switcher for
Central Railway of Brazil**



In Service Throughout the World

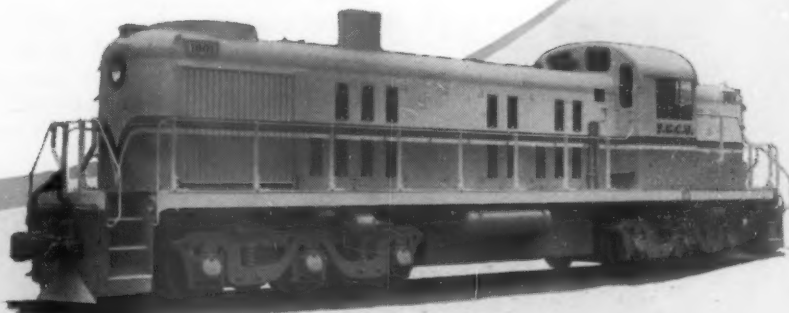
More and more Diesel-Electric locomotives for service throughout the world are being built with **COMMONWEALTH Motor Trucks**. In Australia, Algeria, Brazil, Pakistan and Uruguay, as well as in North American countries, these trucks are materially helping to reduce locomotive maintenance costs and "out of service" time.

COMMONWEALTH One-Piece Cast Steel Truck Frames and Bolsters provide minimum weight with exceptional strength for rugged diesel service. Throughout the world performance has proven the outstanding dependability and economy of **COMMONWEALTH Motor Trucks** in every type of diesel locomotive operation. For all types of service specify **COMMONWEALTH Trucks**.

GENERAL STEEL CASTINGS

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EDDYSTONE, PENNSYLVANIA



1600 H.P. Road and Switching Locomotive
for Central Railway of Uruguay

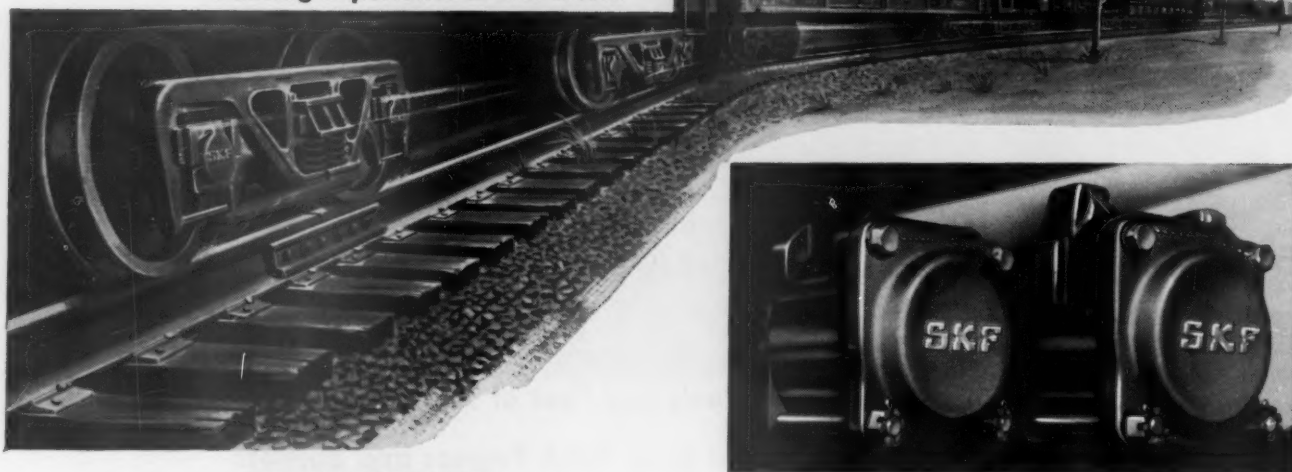


1600 H.P. Road Switcher
for New South Wales Government Railways

The **FREIGHTER** ROLLER BEARINGS

are coming from **SKF**

The Freight Car Roller Bearings Which
are a Product of the Widest Railroad
Bearing Experience in the World



SKF

FREIGHTER ROLLER BEARINGS

Railroading's newest idea is now in practice: Freight cars are rolling on anti-friction bearings! Now that the Railroads are ready—**SKF** is ready with **FREIGHTER** roller bearings that are right for any freight car on any road. **SKF's FREIGHTER** Roller Bearings offer these 8 advantages:

- 1st of **EIGHT** — Maximum safety — eliminates the hot box problem.
- 2nd of **EIGHT** — Best riding qualities — less lading damage.
- 3rd of **EIGHT** — Minimum wear of wheels and truck parts.
- 4th of **EIGHT** — Lowest lubrication cost.
- 5th of **EIGHT** — Longest bearing life.
- 6th of **EIGHT** — Ease of installation; no adjustment.
- 7th of **EIGHT** — Adaptability to both pedestal and integral side frames.
- 8th of **EIGHT** — Best overall economy.

The **FREIGHTER** roller bearings are the culmination of 40 years of patient engineering and thorough road tests under railroad operating conditions. For, throughout the world, **SKF** Journal Bearings have been applied to over 52,800 freight cars, 30,000 passenger cars,

and over 11,300 steam, diesel and electric locomotives—by far the most extensive experience of any bearing manufacturer.

SKF INDUSTRIES, INC., PHILA. 32, PA.,—
manufacturers of **SKF** and **HESS-BRIGHT** bearings.

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You'll see the **SKF** trade mark throughout the world, on more journal boxes in service than any other trade mark.

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SKF
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JOURNAL BOXES

LIGHTING by "Safety"



presenting the

"ATLANTA"... the most beautiful fixture made for lounge, dining and observation cars

• The sleek lines of the "ATLANTA" augmented by translucent ribbed Albalite glass give unusual decorative beauty to car interiors. Soft, even lighting of high intensity produces a new highlight in car comfort.

High light transmission... dust tight seals... a smooth, satin aluminum finish... and perfect craftsmanship... make the "ATLANTA" the most modern and distinctive fixture available for your deluxe lounge, dining and observation cars.

• Designed for two types of application... the "ATLANTA" may be installed as an individual fixture or several units may be placed end to end for continuous row mounting.

The "ATLANTA" is representative of our complete railway lighting fixture line. Contact our nearest district office for further information concerning LIGHTING... by "SAFETY". Write for form 4521 which contains additional "ATLANTA" specifications.

THE **SAFETY** CAR HEATING AND LIGHTING **COMPANY** INC.

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SAFETY COMPANY PRODUCTS INCLUDE: Air-conditioning Equipment • Genemotors • Generators • Fans • Regulators • Blower Units • Lighting Fixtures • Switchboards • Luggage Racks • Motor Alternators • Dynamotors • Motor Generators • Dual Voltage MG Sets

G-R-S cTc

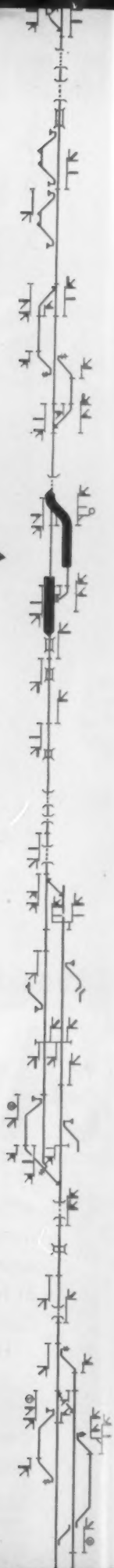
Breaks a Bottleneck

This non-stop meet saves 24 minutes!

Before On 19 miles of single track between ends of double track on a southern railroad, traffic was slowed because of numerous tunnels, bridges, and curves.

After With the installation of G-R-S Centralized Traffic Control, average freight time is cut 12 minutes and speed has increased 5 m.p.h. Train stops are saved.

You can obtain similar benefits with G-R-S cTc. Ask your G-R-S district office for data and studies.



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Main Office
ROCHESTER 2, N. Y.

411 Olive St.
ST. LOUIS 1 A-2634



What's New in Products



Material Carrier

The Getman Brothers Manufacturing Division, South Haven, Mich., has introduced a material-handling machine, designated the Scoot-Crete, into the railroad field. This machine, which can be used with either a flat platform or a manually operated dump box, is available in several sizes and models to meet a variety of needs. The Model

N52 (shown in the accompanying illustration) is powered, as are other models of the Scoot-Crete, by a Wisconsin air-cooled, gasoline engine and features a five-speed truck-type transmission, caster steering, and positive braking. Model N52 will handle a recommended load of 2,500 lb., and is said to be capable of ascending a 25 per cent scaffold grade.



Alternating Current Welder

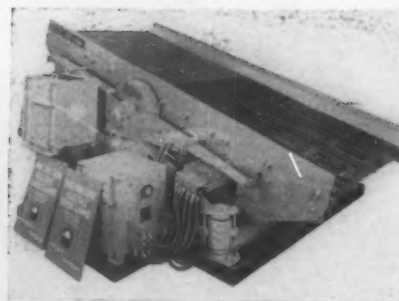
A redesigned 300-amp. a.c. welding transformer, featuring stepless current selection from 40 to 375 amp., has been announced by the General Electric Company's Welding Department, Schenectady 5, N.Y.

The new welder, for practically all applications from light-duty, low-current sheet metal work to heavier-duty, high-current jobs, incorporates an enlarged scale and finely threaded screw adjustment to facilitate easy current selections. It accommodates electrodes from 3/32 to 1/4 in. in diameter, and a handy range switch enables the operator to change quickly from high to low or low to high range.

Arc-stabilizing capacitors in the redesigned equipment, the maker states, contribute toward increased production by enabling the operator to strike and maintain an arc without popouts.

Extra protection against high temperature coil failure is provided by silicone insulation, a resin which retains its mechanical and electrical strength at high temperatures. To further protect the coils from hotspots, they are ventilated by a forced-draft fan rated for continuous duty.

The welder is built with studs at the base to simplify connecting electrode and work cables. Power-factor-correction capacitors reduce power costs.



Electric Heater For Screen Cloth

A method of heating screen cloth by electricity to minimize clogging when wet materials are screened has been announced by Hewitt-Robins, Inc., Stamford, Conn.

Electric current is carried to the screen by short insulated cables attached to copper bars under the screen cloth which make direct contact with it. Worn cloth can be replaced as easily as before addition of the heating equipment. The current distribution bars are shielded from abrasive action of material being screened, thus preventing weak or broken contacts due to corrosion of steel or copper parts.

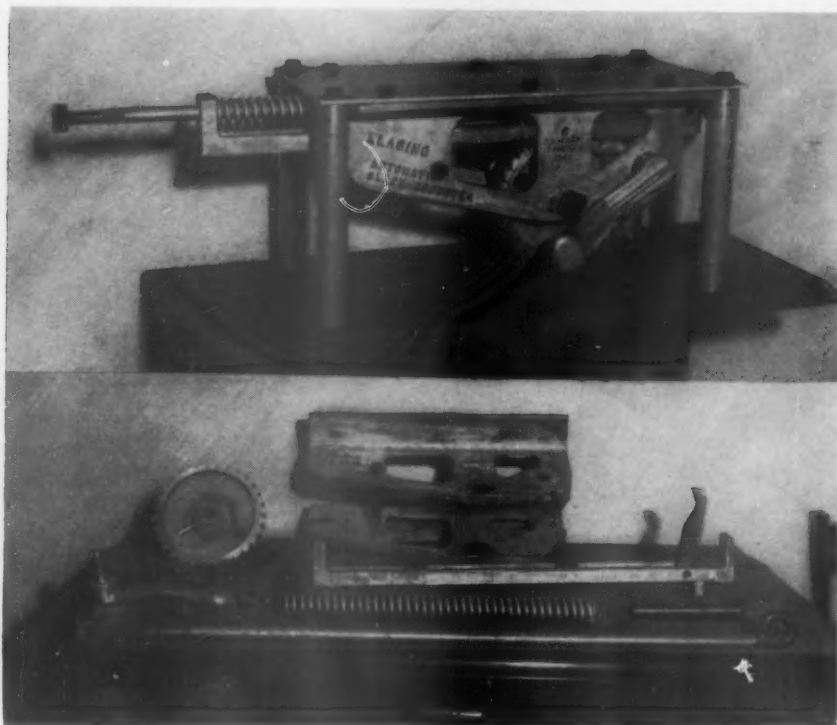
Current going into the screen cloth is regulated by a Hannon variable-step screen cloth heater. Voltages range between 5 and 15 volts, and current values from 1,000 up to 4,000 amp. The heated screen cloth dries out and bakes wet coal, clay, stone or other material as it tends to build up on the screen cloth wires. This causes it to flake off instead of "blinding" the openings.

The automatic cleaning is said to speed up the processing of wet materials, assure efficient sizing and prevent screen cloth wear resulting from beating or other manual cleaning methods.

Klasing Slack Adjuster

After two years of exceptionally severe tests on a 70-ton gondola car in 24-hour bar-steel-mill service, the mechanical automatic slack adjuster illustrated has been applied to freight cars on eight railroads. It is manufactured by the Klasing Hand Brake Company, Joliet, Ill., and sold through the P-W Specialties Corporation, Chicago, and its representatives. A special feature of this slack adjuster is the use of only seven major parts which are easily assembled and held in place by a single cotter and a small nut.

The Klasing slack adjuster is said to keep piston travel between any prescribed limits desired within a range of less than one inch wear on brake shoes



Klasing automatic slack adjuster (above) disassembled (below) to show seven major parts.

and foundation brake rods and levers. The device operates in harmony with the power brakes and independently of the hand brake with no connection to the brake cylinder or hollow piston. It

is mechanically locked against shocks, preventing false take-up or let-out of piston travel, except by manually lifting the release lever.

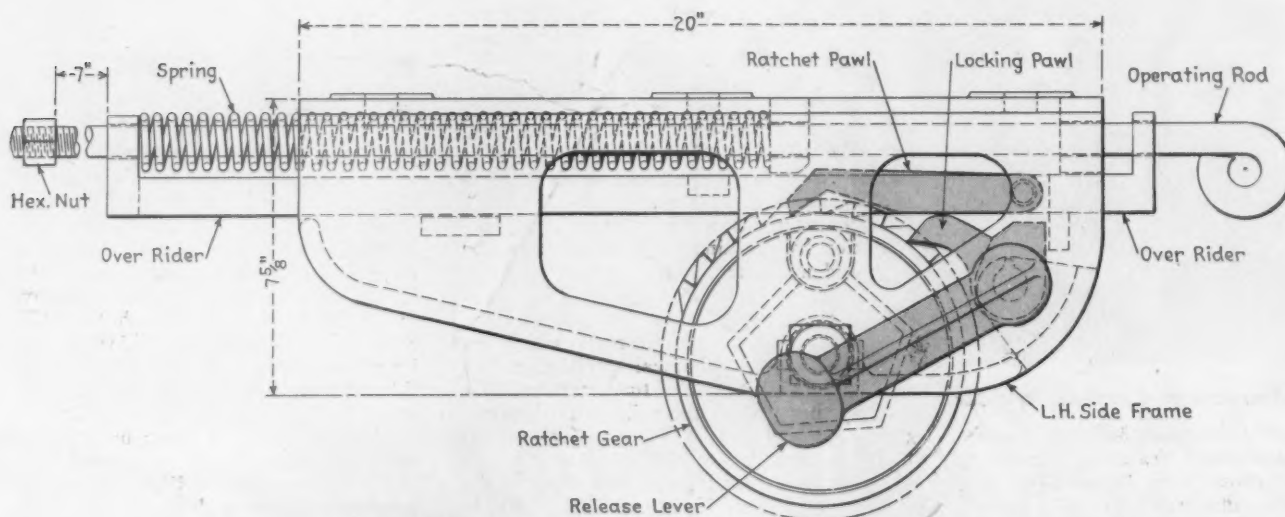
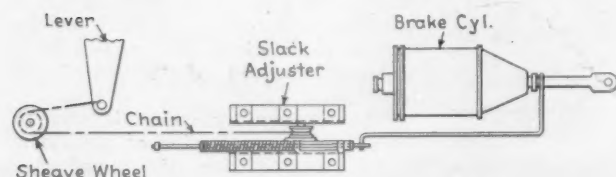
This slack adjuster is designed to

operate without lubrication. The spring is of chrome vanadium steel, cadmium plated. The gear shaft, operating rod and hexagon nut are steel; all other parts are malleable iron. All parts of the slack adjuster, except the operating rod and lever, are held under a spring tension of 100 lb. in release position of the brakes, thus preventing vibration. When brakes are applied, the parts are held in position by the brake-cylinder pressure load, which avoids free slack in changing from release to load or the reverse.

As installed on a car, a rod formed at one end so that it surrounds the cylinder push rod is connected to the eye of the slack-adjuster operating rod. Excessive piston travel causes the rod to move the over-rider and ratchet pawl against the compression of the spring. When the brakes are released, the spring returns the over-rider and the ratchet pawl rotates the gear, taking up the slack through a chain connection to dead cylinder-lever fulcrum. The locking pawl prevents the unwinding of the chain at the next brake application.

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Construction of Klasing automatic slack adjuster which is rugged in design.

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Benchmarks and Yardsticks

THERE ARE A LOT of thoughtful observers who are calling attention to how much faster new machines are coming along than people are learning to tame these machines for constructive work. One of the ablest of such observers is Bertrand Russell, the English philosopher, who has a reputation as a radical and who considers himself a socialist. His writings disclose that he is a lot less radical on many questions than he is reputed to be.

For one thing, he is highly aware of the tendency scientific developments have of helping government to become all-mighty, and hence tyrannical. This point he makes interestingly clear in a new book, "The Impact of Science on Society." He says that government's power began to grow with the invention of gunpowder, and has been increasing ever since. The appearance of the telegraph and telephone, he observes, was useful to the police—and "unfortunately, the men whom the police wish to catch are frequently benefactors of mankind." The invention of the mariner's compass, the industrial revolution, the airplane, nuclear fission—all had beneficial effects, but many which were harmful, too.

Lord Russell is worried about the constant increase in power of government officials. He sees electric power stations—upon which households as well as industry increasingly depend—as a potential source of danger. If they should fall into irresponsible hands, economic and domestic activity would come to a stop. He doesn't recognize that a workman's "right" to close down essential services should take precedence over the community's need to have those services continue.

He doesn't go to the extreme that some viewers-with-alarm have done and advocate the abolition of invention, merely because the control of scientific developments is difficult. He reminds us that: "The Egyptians worshiped bulls, which we think was a mistake, but we do not on that account prohibit bulls. It is only when the Machine takes the place of God that I object to it."

The really important point that Russell emphasizes is that, for all their service to us, science and technology do not give us values. They give us the means of accomplishing things, but no guidance whatever on what to aim at. Knowledge gives power, but, says Russell, "power for evil just as much as for good," unless it is alloyed with wisdom. Knowledge and wisdom are not synonyms. Knowledge is "know how," but "know why" is just as important. Russell, though far from an orthodox religionist, believes that it would be the course of wisdom to cultivate "Christian love, or compassion."

J. G. L.



One of the outstanding achievements in transportation history is the expert handling of big city rush hour crowds. Operating on one minute headways and even less, electrical railroads and subways perform daily miracles in helping the nation get to and from work on time.

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Standby Costs In Car Acquisition

The chief executive of a large railroad has offered some constructive criticisms of the discussion of the freight car situation which appeared in this space just four weeks ago. After examining last year's performance in new-car construction and prospects for the coming year, our analysis concluded, in substance, that more freight car orders by the railroads would be helpful; and that assurance of continuance of liberal amortization for new equipment, and of permanence for last year's freight rate increases, might encourage the railroads to increase their orders.

Our friendly critic says that this discussion was "one of your publication's less penetrating efforts." He suspects we have invited railroad and supply people to become complacent about the freight car situation, and to believe that the problem is somebody else's responsibility. Our discussion was not intended, however, to expound a long-range policy of car acquisition, but was aimed merely at the less ambitious but still important goal of bringing ourselves and our readers up to date about the current and prospective operation of the existing program.

Objectives for the Long Pull

Making the present program work as well as it can is not, moreover, an objective which should hinder in any way the development of a sounder program for the long pull, which is what our critic has primarily in mind. He believes that a policy by the railroads and the car builders which (1) would go much further in the direction of standardization and (2) would commit the railroads to a more dependable program of acquisition, ironing out the "peaks and valleys"—would result in better cars at a lower cost, and would eventually overcome or greatly improve the perennial car shortage and the inadequacy of much of the car equipment to do the job required of it.

"We all order custom-built cars," he goes on to say, "far from a reasonable standard; and we order spasmodically. The carbuilders fail to invest in as much machinery as they might which would

substantially reduce the cost of cars. When we do order cars, therefore, we must pay not only today's labor and material prices, but cover the factor of standby costs, when facilities are kept idle. We also have to meet the high production costs that always characterize custom-built manufacture."

Who would deny that there is a great deal of truth in this opinion? Reasons there undoubtedly are for failure to make greater progress in the desired direction—but, whatever the validity of these reasons, the "feast or famine" characteristic of car buying is not a happy one, either for the railroads or the manufacturers.

No such complex issue as this one is going to be finally resolved in 700 words by anybody, certainly not by your present reporter. It does seem, though, that a key might be suggested which would open up at least one avenue of the labyrinth. That key lies in the words *standby costs*. Almost every business has these costs. The total costs of any product are made up—not just of the costs of the material, labor and machine use which go into it—but also of the cost of the idle time of men and machines which the producer encounters in the natural course of his business.

What Other Businesses Have Done

Some businesses—the food markets for instance—have forged ahead of their competitors, for one reason, by their having contrived to reduce to a minimum the standby time of their plant and labor force, and by using their savings to undersell their competition. Still other businesses—notably the electric utilities—have contrived a system of charges whereby the customer's bill is divided into a standby part and an actual use part. Since the standby charge is constant, the cost burden on actual use is minimized. A price is offered the customer which exercises a strong incentive upon him to make his purchases of electric power at as constant a level as his situation permits. And the consequent greater constancy of load makes for reduced costs and higher earnings to the producer. Both the producer and the regular customer benefit by this kind of pricing.

This standby cost problem confronts the railroads themselves in exactly the same way that it does the carbuilders. That is, there are many shippers who provide their own transportation wherever they can and use the railroads only in emergencies—yet, so far, no method has been evolved for collecting adequate standby charges

from these spasmodic customers. Imaginative thinking about the incidence of standby costs might help the railroads with some of their own problems, as well as suggest to them and the builders some mutually profitable ways for introducing more regularity in equipment acquisition.

Hauling Passengers At Freight Rates

No small factor in the continuing problem of making passenger business pay is the simple fact that the railroads are today providing this expensive service for a lower revenue per gross ton-mile than freight service brings in. For the first nine months of last year, the average passenger car carried 18.3 passengers at a revenue of 2.657 cents per mile, or 48.62 cents per car-mile. Assuming an average car weight of 65 tons—a conservative figure and on the low side—passenger revenue is 0.75 cents per gross ton-mile.

Similarly, for the first ten months of last year, the average lading per freight car was 32.5 net tons. At 1.410 cents per net ton-mile, car-mile revenue comes to 45.82 cents. Again—assuming a conservative figure for the light-weight of the car, 25 tons in this case—the revenue per gross ton-mile figures up to 0.80 cents (45.82 cents divided by 57.5 tons). Thus we have the paradoxical situation that the railroads receive 8 mills per g.t.m. for performing freight service, but only 7½ mills per g.t.m. for the far more expensive passenger service.

How can this paradox be resolved? Obviously, not by a simple increase in fares. Competition is too tough for that, and the result might well be still lower earnings per g.t.m., if car occupancy should decline. Getting out of the passenger business in large degree or entirely may be the right answer for a few roads, but probably not for most. The right solution for most roads is, doubtless, to find some way of hauling passengers at less cost.

Reducing the dead weight per passenger is certainly one means toward this end. This can be done both by lighter equipment and by getting more people to ride in each car. The former could very well be the means to the latter by lowering the cost of rendering the service and thus permitting it to operate profitably at lower fares, attracting more business and further lowering the payload-to-gross ratio.

Should there not be a serious and concerted attempt to cut down the fantastic weight that the railroads carry around for each passenger? A substantial financial outlay for research on how to reduce weight without sacrifice of safety or conve-

nience is certainly in order. Passenger business offers at least the potential of substantial profits, where prospective traffic is available—if only costs could be brought down to the point where attractive rates could be used to get in the customers.

Passengers Are Friendlier

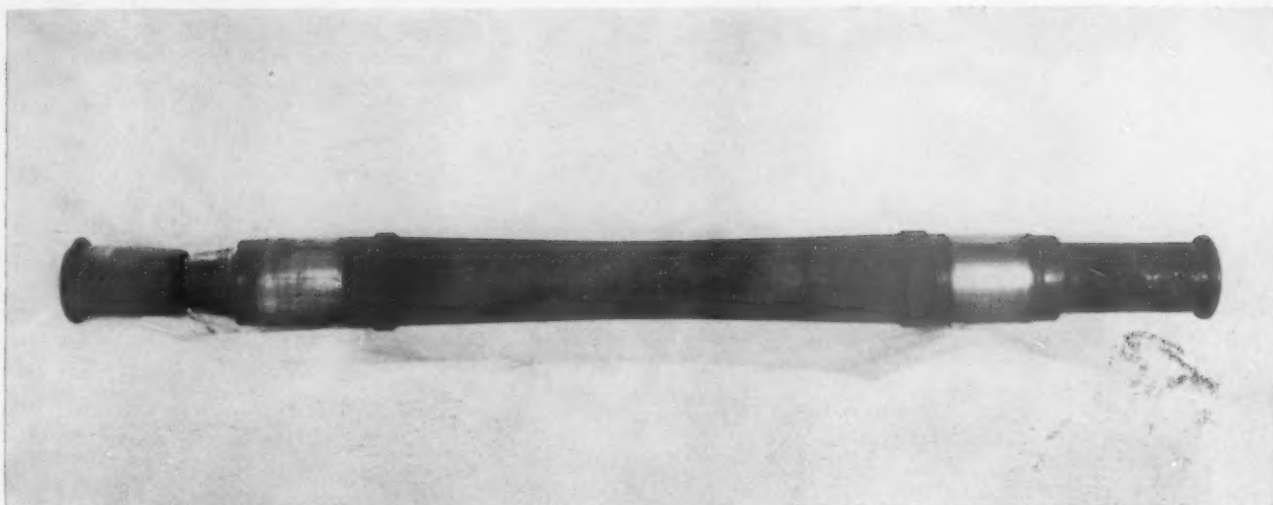
What has long been a tenaciously held opinion of this paper—that passenger service molds public opinion about railroads in general more powerfully than anything else—was confirmed in a recent “outside” survey made for the Southern Pacific in the San Francisco and Los Angeles areas.

The chief object of the advertising department in the opinion sampling was to find out how the road stood in comparison with other large corporations—including rival railroads. Thus the emphasis of the interview questions was on the attitude of the general public toward the SP as a company, rather than as a purveyor of passenger travel. Nevertheless, more than 75 per cent of the people who had at some time ridden the road's trains were favorable toward it as a corporation, (14 per cent “indifferent,” 8 per cent “unfavorable” and 3 per cent “no opinion”), while, of those who had not been passengers, only 57 per cent favorable (27 per cent “indifferent,” 6 per cent “unfavorable” and 10 per cent “no opinion”). There was no “rigging” in the interview: the question about attitude was entirely unrelated to consideration of passenger service.

When it came to specific questions about passenger service, the survey showed conclusively that good equipment is by far the major factor in public acceptance, and alleged lack of it the major dissatisfaction of the small minority not “sold” on SP. At least 78 per cent of those interviewed appreciated the road's postwar passenger equipment.

The survey should be heartening to railroad men. Bigness is no longer a cause for public dislike—at least not in California. The very companies which the public guessed were biggest also got high ratings in popularity. Also, railroads showed up well among utilities, merchandise chains and oil companies. All but one of the railroads in the survey got higher ratings than the air line included. Most of the people would freely grant the railroads a profit margin of ten cents or more per dollar of invested capital.

It is good to learn that in California most people are friendly toward railroads; that the old hatred of “soulless corporations” is fading. It is important to remember that learning about good passenger service and riding on good passenger trains make more of them feel that way.



HERE'S WHAT HAPPENED: In a test to destruction without lubrication—*Left*, journal burned off under bronze bearing after only 42 miles; *Right*, journal intact under iron-back bearing after 105 miles of running.

Hot-Box Research Results

... IN THE IRON-BACK JOURNAL BEARING

How a successful search for the cause and prevention of burned-off journals has brought about an alternate A.A.R. standard for plain bearings

Written especially for *Railway Age*

By J. J. LAUDIG

Research engineer
Delaware, Lackawanna & Western

Railroad research engineers have always given to the hazard of burned-off car journals an important place among railroading problems most urgently in need of solution. The Association of American Railroads has a standing committee studying that problem, and the seriousness of the hazard and extent of resultant damage are a matter of report for Interstate Commerce Commission records.

Over a long period numerous measures have been devised in the hope of eliminating accidents resulting from burned-off journals. The measures have been largely ineffectual because of the mistaken but quite natural assumption that the direct cause of burned-off journals is the intense heat accumulating within the journal box, when, for any reason, lubrication is inadequate or destroyed and metal-to-metal friction results.

What Laboratory Tests Showed

Long research at the Lackawanna laboratory to determine the actual cause of burned-off journals indicated, however, that it was to be found in some factor other than the heat itself. In our pursuit of a possible different cause, a large number of journals at progressive stages

of damage were made the subject of research. Studies and comparisons were made of journals that had only been heated, of journals that had been heated and cut, and of journals that had been heated, cut and burned off.

But no matter what the progressive stage of damage, study and comparison of the points of failure of the journals revealed a similarity of pattern. The burn-off was found usually to be square, with little reduction at the point of failure, generally occurring about two-thirds of the distance from collar to fillet. The point of failure was found to be not the point of greatest stress, but the point of highest temperature and load concentration.

Additional information pointing to a possibly different cause of burning-off was gathered from trainmen and carmen. Their observations revealed marked differences in time between the detection of hot boxes and burning-off of journals, and they revealed, also, marked differences in the temperature at which the various breaks occurred. These reported inconsistencies of behavior under what seemed to be similar conditions were significant signposts to the ultimate conclusion that the *burn-offs* were not caused directly by heat.

In physical, chemical and microscopic examinations of the damaged and burned-off journals to determine the kind and extent of change from new steel journal condition, we found, in general, the following:

The usual tensile test of the steel journal midway between center and surface revealed reduced tensile strength, lower yield point ratio, and increased ductility in the steel below the surface. At the surface the metal



A STANDARD BRONZE JOURNAL BEARING tested in comparison with the iron-back bearing.



MEEHANITE IRON-BACK JOURNAL BEARING prepared for babbitting by the Kolene process.

was weak, with little or no ductility. Metal chips at the surface were short and brittle, gradually showing more ductility as distance from surface increased. This condition at surface and directly below could easily be seen by turnings.

Also at the standard test location, i.e., midway between center and surface, our chemical analyses of the steel showed no variation from accepted specifications. But at the surface location and increments below the surface, our analyses showed a notable amount of copper, the amount of copper decreasing with distance from the surface.

Then we took acid etchings of cross-sections back of the point of failure. These also showed, for the most part, sound steel structure below the surface, but at the surface we found cracks and presence of copper.

Finally, microscopic examination of the surface metal and the area directly below showed copper between the grains. This intercrystalline copper penetration varied in depth below the surface of the burned-off journals and cut journals, especially in the area where failure occurs.

These cumulative observations and comparisons all seemed to point away from the long-held belief as to the cause of journal failures. The appearance of copper penetrating where copper had no right to be, hinted at the true reason for journal failures and for the peculiar embrittled appearance of the broken journals. To repeat, a common point of failure of the journals being examined was not the point of greatest stress but the point of highest temperature and load concentration.

We began to realize what happens in the journal when a hot-box occurs. When extreme heat develops, the

babbitt lining of the bronze back or shell melts and squeezes out, allowing the bronze shell of the bearing to come in contact with the steel journal rotating under and in contact with the bearing. Frictional heat, bending stresses, and contact between the steel and bronze bring about migration of copper from the bronze shell onto the steel journal. The copper then penetrates the steel journal and the surface along the grain boundaries of the steel. From the surface inward, then, the steel granulates and becomes weakened.

In some cases under these conditions the journals break off, although in other cases the hot-box is discovered before the copper has penetrated far enough to cause an immediate break. In the latter event the detection of a hot-box avoids the danger of burn-off if the car is set out of the train. But if it is continued in service, the journal, being permanently weakened, subsequently breaks or fails by the progression of the fracture now inherent in the journal, and detection in such a case has only *delayed but not prevented* a journal failure.

With this discovery of the migration of copper from the bronze shell and its intercrystalline penetration through the surface of the steel journal, it was then possible to reproduce these conditions in the laboratory in small scale tests, and to produce similar failures.

This copper penetration was further demonstrated by a simple experiment in which a $\frac{3}{8}$ -in. steel rod was heated and—while it was being bent or held under stress—then rubbed on the bent surface against a small section of bronze bearing back, or any copper base metal. An immediate brittle break confirmed the belief to which our research had led us, that burned-off journals are caused not by lubrication failure and consequent

frictional heat but by the weakening resulting from penetration of copper into the grain boundaries of the steel journal.

There still remained the task of preventing copper penetration into the steel journal. A study was made of readily available journal shell or back materials that would contain no copper. Not just any cast metal could be used for a bearing. It had to be a metal of superior physical properties and capable of making a better bond with the lining metal than any yet known. Our experiments proved that common gray iron, for example, could not stand up under the hammering blows that railroad journal bearings must take in use. The bearing had to withstand punishing impact stresses without weakening.

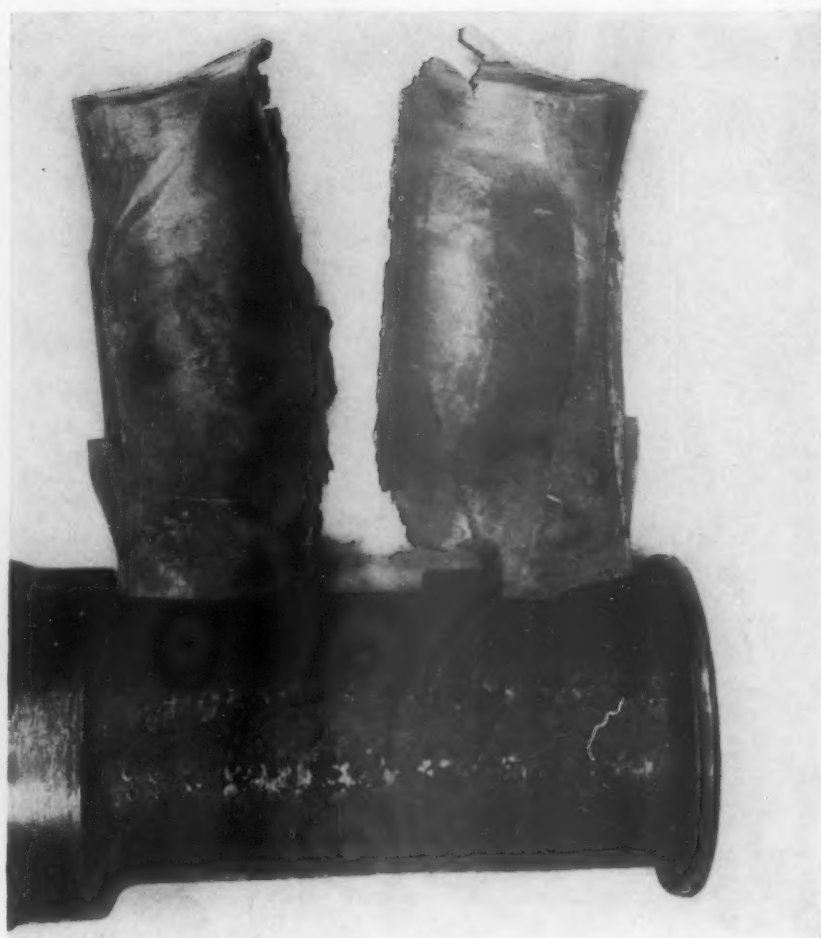
Further experiments showed that the desired results could be achieved with the use of a high-strength pearlitic cast iron. While there are several high-strength cast irons which might be employed and are satisfactory, we chose Meehanite B as most suited to our use. Meehanite is a pearlitic cast iron with a structure identifiable as such, and it has been well known practice to produce Meehanite castings having a strength much higher than the strength of bronze.

With the task of finding a suitable metal for the back was combined the search for a stronger lining-to-back bond than had theretofore been used for railroad journal bearings. In a railroad journal bearing it is vital to secure the most tenacious bond between babbitt lining and shell and one which will retain that character at normal operating temperatures at full load and high speed. In a journal box the heat generated by the rotation of the axle under the bearing will build up in the journal unless it can be dissipated from the axle through the lining directly to and through the bearing shell or carried away by the circulated lubricating oil. A poor bond will prevent normal dissipation of frictional heat and will allow oil to get between babbitt lining and the back and further reduce this transfer or dissipation of frictional heat.

In our search for the best possible bond we tried, and had to discard as unsatisfactory, all the older suggested methods of attaching a babbitt lining to a shell or back. Cast iron was a difficult metal to bond, as we surely can testify. In addition, we were searching for a uniform bond and for a stronger bond at operating temperatures.

How the Bonding Is Done

The final surface preparation method adopted was the Kolene process, which proved to be ideally suited for forming a tight bond. In this connection, the important

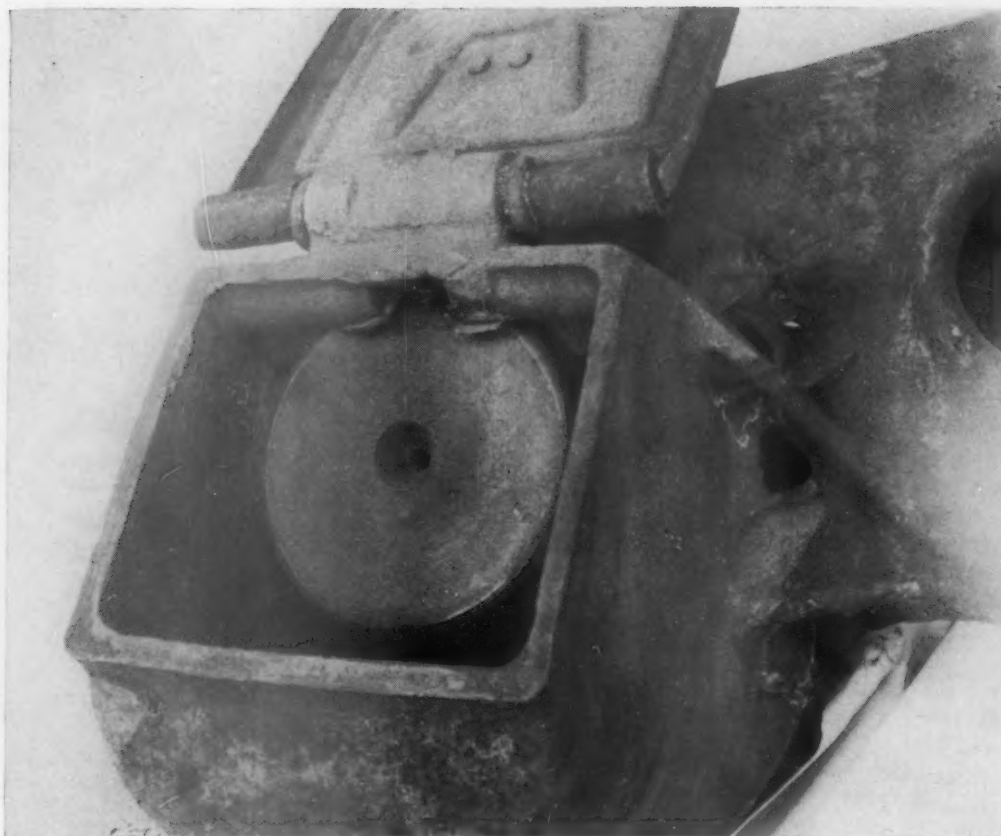


JOURNAL AND IRON-BACK BEARING at the end of the first 45 miles of test without lubrication.

factor in Meehanite is that its strength directly involves the physical constitution of the metal. In the pearlitic cast iron the metal is deoxidized and graphitized so that the graphitic particles have a characteristic distribution which is known and identifiable. Graphitic particles are uniformly distributed throughout the casting and those particles exposed at, but embedded in the surface of the casting, can be removed when the casting is treated by the Kolene process.

Briefly, the Kolene process consists in subjecting the casting to an electrolytic bath of alkaline salts, thus oxidizing the carbon particles at the surface, forming carbon dioxide. The casting is then subjected to a reducing action to remove any oxides present. There remains, then, a surface free of exposed carbon particles. All the free and embedded carbon having been removed by this treatment, when the casting is tinned and babbitted (in the customary manner) there is secured both an intimate chemical bond of tinning mixture to cleaned iron and a mechanical bond of babbitt in the graphite-free cavities. This gives a doubly secure bond of the utmost tenacity.

We were eventually ready to test in actual service the result of our research and experiments. On May 29, 1945, standard sized bearings made of Meehanite B high-strength cast iron, lined with babbitt metal bonded to the shell, were installed in the tender of a DL&W steam yard engine at Kingston, Pa. After those bearings



AFTER 105 MILES without lubrication the iron-back bearing was worn in half and the journal collar riding on the wedge.

had remained in service on the yard engine for 21 months, they were removed and examined and were found to be in excellent condition, with only moderate end wear.

While that test was running satisfactorily, a more rigorous road test was projected—a “test to destruction” of the iron-back bearing* under actual operating conditions. For that purpose the DL&W reserved a section of track between Scranton, Pa., and Pocono Summit.

In preparation, we placed an iron-back bearing at one end of an axle under a hopper car loaded with 140,000 lb. of coal, having removed all lubrication from that journal box. At the other end of the same axle we placed a conventional bronze-back bearing with the usual lubrication in the journal box. We intended, by inducing a “hot box” around the Laudig bearing, to prove that a burn-off of the journal would not result from a hot box carrying a bearing made according to the results of our research.

Hot Boxes to Order

We started up the mountain in the early morning of August 26, 1946, the test car being part of a special train complete with wreck derrick, crew and full adjuncts. We made numerous stops for inspection and to record our observations. Of course, the expected—and desired—hot box developed around the iron-back bearing, and the bearing was progressively demolished by friction of the steel journal against it.

* The iron-back bearing developed on the Lackawanna under the direction of Mr. Laudig is generally known as the Laudig Iron-Back Bearing.

At the end of 45 miles the red hot journal under the bearing had worn well into the bearing and even impressed into the wedge above it. The friction between the journal and bearing wore the bearing in two, but *the journal remained intact although red hot*. We proceeded with the heated journal thrusting through the broken bearing to the end of our route, a total of 63 miles.

To establish our theory beyond any shadow of doubt, for the return trip from Pocono Summit another iron-back bearing was installed in place of the demolished bearing, *over the same hot journal*, again without lubrication in the journal box. This time lubrication was also removed from the journal box containing the standard bronze-back bearing at the other end of the same axle. The hot boxes for which conditions were set up soon developed, one at each end of the same axle. At the end of 42 miles of the return trip, the journal under the standard bronze-back bearing failed by the typical burn-off. So we had at this point, at one end of the axle a broken journal under a bronze-back bearing after 42 miles without lubrication, and at the other end of the axle, a red hot journal still intact after 105 miles under the iron-back bearing without lubrication. The entire truck used for the experiment was then replaced by a new truck by use of the wreck derrick which was part of the test train, and the return run to Scranton was completed.

At Scranton, in our laboratory, both journals were examined. As our research and tests had led us to expect, the broken journal which had been under the bronze-back shell disclosed copper penetration of the surface of the

steel at the grain boundaries, with the typical embrittlement and weakening, which led to failure of the journal after 42 miles under hot-box conditions. The journal under the iron-back bearing, after 105 miles without lubrication, showed under examination only that it had been heated, and apparently it could have carried the car an indefinite distance farther. Etching and examination of a longitudinal cross-section of this latter journal disclosed that at the point of greatest heating the steel had not been materially impaired.

Moving pictures were taken of this road test and later photographs of the sectioned and etched journals were made in the laboratory at Scranton.

Because of the results of this road test, a number of other tests were made on the Lackawanna under express cars, mail cars, soda ash hopper cars and tenders of passenger engines imposing a variety of load and running conditions, and the bearings continued to prove entirely satisfactory in service.

We now felt confident that we had found the answer to one of railroad's most harassing problems, and we brought the iron-back bearing to the attention of the Mechanical Division of the A.A.R. It was referred to the Committee on Journal Bearing Development, which authorized tests which were made at the association laboratory at Indianapolis in July 1949. These tests, including the 65-hour hot-cold continuous test—equivalent to 3,250 miles at test room temperature starting at 100 deg. F. and decreasing to 20 deg. F. below zero—showed satisfactory test performance.

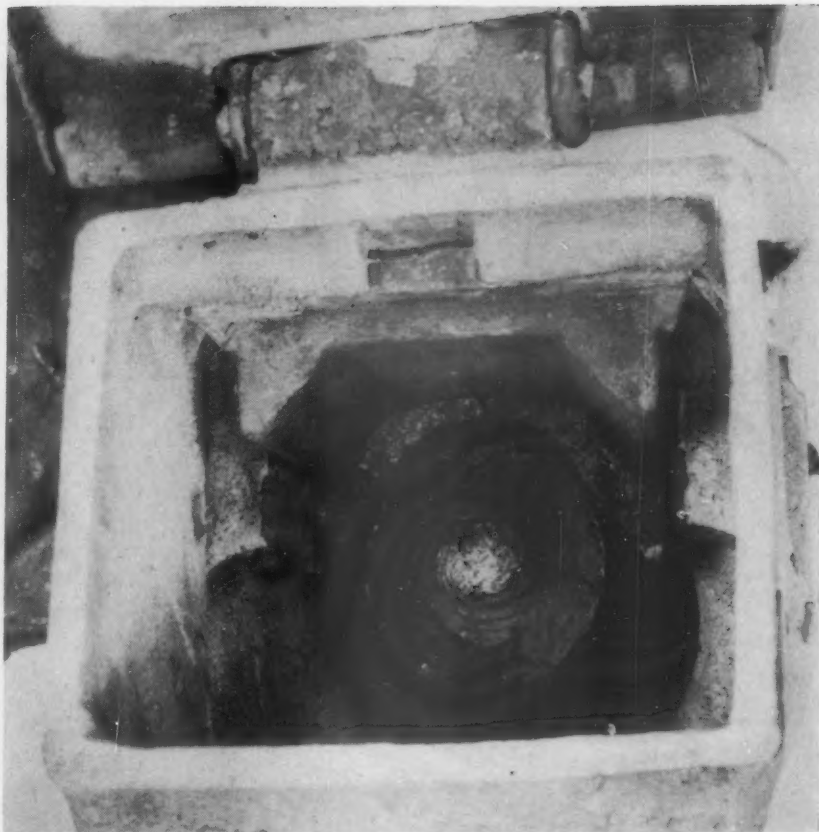
On November 18, 1949, the A.A.R. Lubrication Committee recommended the test of 100 car sets of the iron-back bearings in railroad interchange. The General Committee of the A.A.R. approved this recommendation. Six railroads applied for the bearings for test: the Pennsylvania, New York Central, Norfolk & Western, Baltimore & Ohio, Denver & Rio Grande Western, and DL&W.

The 600 bearings for interchange test were made by the Cleveland Graphite Bronze Company, whose chief engineer recognized the value of the new bearing and had his engineering and development staff produce the first commercially made iron-back bearings.

Interchange Railroad Test

The bearings for interchange railroad test were applied by the six railroads to cars of all varieties, including those undergoing repairs and new cars. These tests have been under way since the fall of 1950. Some bearings have been removed for end wear and broken lugs but there have been no reported removals for spread linings.

Although some bearings have been involved in serious hot boxes, there have been no burned-off journals, which



INTERIOR OF THE JOURNAL BOX with bronze bearing at the end of a 42-mile run without lubrication.

has verified the need for this bearing and has rewarded the research and development.

All of these service tests to date were reviewed by the A.A.R. Lubrication Committee at its meeting on February 13, 1952, and that committee recommended to the General Committee that the Laudig iron-back bearing be given A.A.R. approval as an A.A.R. alternate standard railroad journal bearing. The association at its annual meeting on July 28, 1952, approved the recommendation of the Lubrication Committee, and action was confirmed by letter ballot of all railroads.

Advantages of Laudig Bearing

All tests have shown that the Laudig iron-back bearing overcomes the real cause of burned-off journals—the penetration of copper into the steel journal at the grain boundaries. Tests have also shown the Laudig bearing to have additional advantages, among which are:

1. Its high strength flat back, permitting more uniform distribution of the load of the car over the length of the journal and resulting in reduction of bearing temperature.
2. Its high strength and rigidity, resulting in great reduction in spread linings.
3. The method of bonding the babbitt to the back or shell, whereby the bond is not reduced or lost at operating temperatures prevailing under heavy loads and summer heat; loosening of the lining is eliminated.
4. It is of standard A.A.R. dimensions and completely interchangeable with the present standard bearing.

BUDD RAIL DIESEL CAR OPERATING EXPENSES

Cost Per Car-Mile

	Car-Miles	Repairs	Crew	Out-of-Pocket Expenses		Fixed Expense	Total
				Other Out-of-Pocket	Total Out-of-Pocket		
Road A—Car Pool 65,000 mi. per car per year	1,024,646	\$0.1701	\$0.3217	\$0.1358	\$0.6276	\$0.1403	\$0.7679
Road B ₁ —Car Pool 95,000 mi. per car per year	869,075	0.1941	0.2700	0.1562	0.6203	0.0890	0.7093
Road B ₂ —Run 1 74,000 mi. per car per year	61,212	0.1981	0.2261	0.1686	0.5928	0.1228	0.7156
Run 2 73,000 mi. per car per year	54,762	0.2382	0.2627	0.3103	0.8112	0.1268	0.9380
Run 3 115,000 mi. per car per year	28,830	0.1158	0.2237	0.1573	0.4968	0.0582	0.5550
Run 4 28,000 mi. per car per year	47,003	0.4590	0.7828	0.5192	1.7610	0.2653	2.0263
Road B ₃ —Run 1 76,000 mi. per car per year	88,772	0.3267	0.3581	0.1688	0.8536	0.1108	0.9644
Run 2 36,000 mi. per car per year	6,046	0.4462	0.2769	0.2921	1.0152	0.1346	1.1498
Road C—2-Car Train 73,000 mi. per car per year	217,834	0.1724	0.2428	0.1529	0.5681	0.1207	0.6888
Road D 38,000 mi. per car per year	29,075	0.1735	0.3251	0.1035	0.6021	0.2587	0.8608
Road E 120,000 mi. per car per year	435,836	0.2216	0.4544	0.1715	0.8475	0.1000	0.9475
Road F—Car Pool 53,000 mi. per car per year	105,704	0.0848	0.2703	0.1322	0.4873	0.1033	0.5906
Road G—Car Pool 105,000 mi. per car per year	52,569	0.0766	0.2781	0.1188	0.4735	0.1113	0.5848
Road H—3-Car Train 72,000 mi. per car per year	429,527	0.2531	0.2543	0.1492	0.6566	0.1528	0.8094
Road I—Car Pool 69,000 mi. per car per year	462,134	0.3044	0.2646	0.1758	0.7448	0.0848	0.8296
Averages		0.2112	0.3078	0.1596	0.6786	0.1174	0.7960

Data from Coverdale & Colpitts.

USERS' FIGURES SHOW

Diesel Cars Opening New Era

Their appeal to passengers plus economical and reliable performance result in improved revenues while costs are trimmed

The actual operating and traffic experiences of railroads owning and operating the Budd Company's self-propelled rail-diesel (RDC) passenger cars are reviewed in two reports recently made available to the industry. Both

bring up to date information contained in similar reports published in 1949.

One report,* prepared by the consulting engineering

* Prepared for the Budd Company, Philadelphia 32, Pa.



DIESEL RAIL CARS have turned some losing passenger trains into profitable operations, and have made possible the establishment of entirely new, profitable passenger services.

firm of Coverdale & Colpitts, deals with the operating expenses of RDC cars based on experiences accumulated by the 78 cars in revenue service last summer. The second report,* by Stanley Berge, professor of transportation at Northwestern University School of Commerce, reviews recent developments in the United States and in 13 foreign countries with respect to self-propelled rail cars and multiple-unit motor passenger trains.

The findings developed by Coverdale & Colpitts concerning the operating costs of the RDC cars in actual service are summarized in the accompanying table, reproduced from the report, which covers operation of 54 cars. The variation in cost between cars can be attributed, partially at least, to the different mileages operated. Costs of those having nearly similar mileage show closer correlation. The weighted average cost of all the runs is 79.06 cents per car-mile.

The variation in car repair figures is related to the fact that some cars were relatively new and had only been subjected to minor repairs, while others had received rather complete overhauls. These figures also reflect some mechanical defects in earlier models, which have since been largely eliminated.

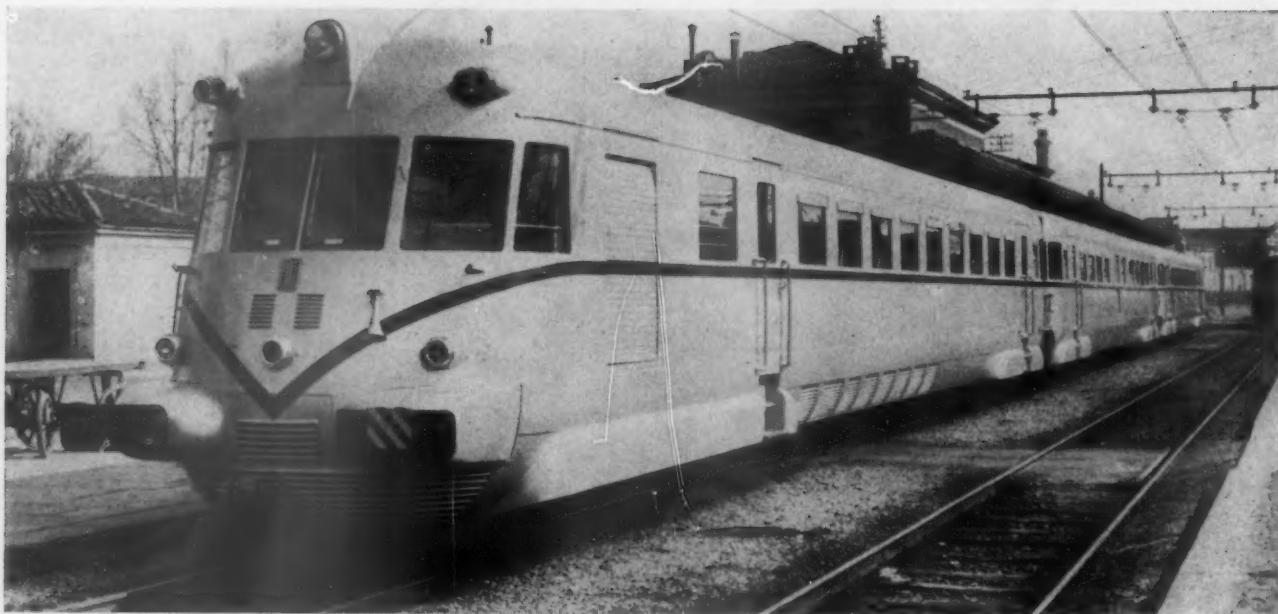
The availability of the cars has been excellent, the report observes, with one road reporting that no car had missed a single scheduled run in more than a year of service, and the others reporting an average availability of 95 per cent.

* "Self-Propelled Diesel Cars and Multiple Unit Trains," by Stanley Berge. Available from the Transportation Department, Northwestern University School of Commerce, 339 East Chicago Ave., Chicago 11, at \$1 per copy, postpaid.

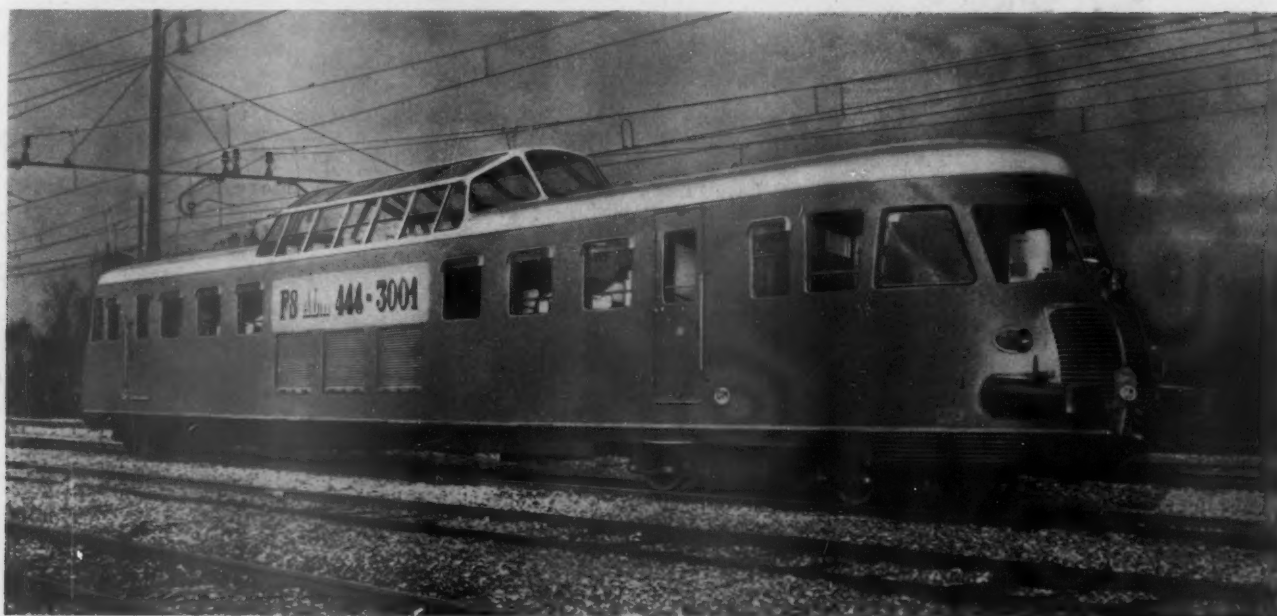
"Throughout our study," the Coverdale & Colpitts report concludes, "we found generally that railroad personnel from top operating officers down were well pleased with the RDC. Different ideas were expressed as to its usefulness, some thinking that it was useful only in certain limited operations, another stating that in his opinion the potentialities of the car had hardly been explored."

In his discussion of the Budd Company's RDC car—currently the only equipment of this type being regularly manufactured in this country—Mr. Berge reports on the wide acceptance earned by these cars from operating, mechanical and traffic officers. He remarks that low operating expense and mechanical reliability have enabled them to replace "standard" locomotive-drawn equipment at great reduction in cost, and often with accompanying increases in revenues. How a few railroads have capitalized on the car's economical and mechanical advantages in establishing completely new economically self-sufficient services is also reported. In this connection, Mr. Berge has assembled some specific cost figures which are reproduced herewith. Not all railroads maintain cost figures for their RDC operations, nor do those which do so compile them on a comparable basis.

Mr. Berge deals also with post-World War II developments in the use of self-propelled rail cars and multiple-unit motor trains overseas—principally in Europe. Here, his report notes, "the use of rail cars has rapidly increased to a great extent, and it appears that this development will continue due to the continuing favor it finds with the public and the operating advantages obtained." It is the European practice not to use such equip-



SPANISH MULTIPLE-UNIT MOTOR TRAIN built in Italy.



DOMED DIESEL RAIL CAR built in Italy.

ment for "substitutes," but as tools designed for specific tasks. The equipment is as widely used for high-speed, long-distance "de luxe" services as for secondary branch line and local runs.

The report concludes with the observation that "just as centralization of population in great cities created demand for the long-distance locomotive-propelled train, so decentralization, both regional and suburban, is now creating demand for the self-propelled multiple-unit train."

This report is the second to be issued on the subject of self-propelled motor cars and multiple-unit motor trains by Northwestern University. The first, by Stanley Berge and S. A. Loftus, was published in May 1950, and dealt with the mechanical adaptability of such equipment.

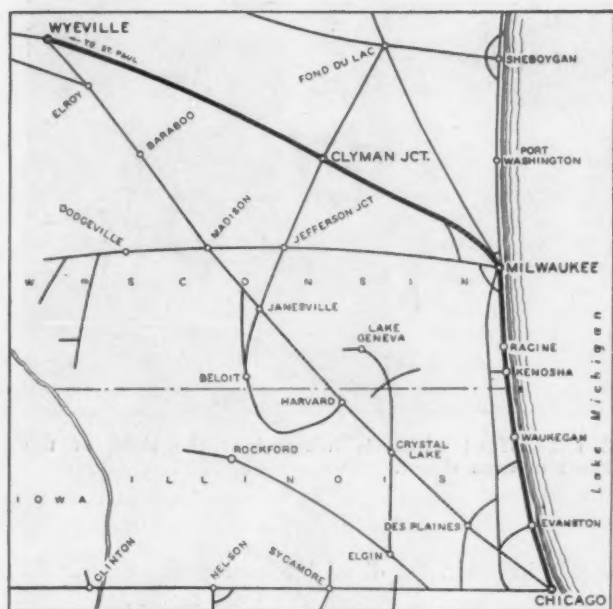
ACTUAL OPERATING COSTS OF RDC CARS IN SERVICE

As reported by Stanley Berge

		Out-of-pocket Cost	
		Per Train-Mile	Per Car-Mile
AT&SF	— One 2-car train	\$0.927	\$0.464
B&O	— One 2-car train	1.490*	—
C&NW	— One 3-car train	1.346	.456
NYC	— Two 1-car trains† .....	.771	—
NYNH&H	— Representative 1-car train .....	.590	—
P-RSL	— 2-car, 4-car, and 6-car trains	—	.708
WP	— One 1-car train .....	.870	—

*Includes \$0.48 Washington Terminal Expense.

†In service between Boston and Springfield, Mass.



SAFETY IS ENHANCED on the 235-mile heavy duty line between Chicago and Wyeville by . . .



AUTOMATIC TRAIN-STOP SYSTEM which allows the "400" streamliner to travel up to 100 m.p.h.

Higher Speeds with Train Stop

North Western's fast passenger route now protected by automatic system which applies brakes if engineman disregards wayside signal aspects

An intermittent inductive automatic train-stop system has been installed by the Chicago & North Western between Chicago, Ill., and Wyeville, Wis.; this 235-mile stretch is more than half of the 406 miles of the high-speed route between Chicago and St. Paul-Minneapolis, via Milwaukee. The devices, applied to the locomotives, operate in conjunction with inductors at the wayside signals, so that, if a wayside signal is displaying an aspect which calls for a reduction in speed or a stop, the brakes will be applied automatically to stop the train if the engineman does not "acknowledge," by having the acknowledging lever in the cab in the acknowledging position as the locomotive passes over the inductor.

Additional protection was the reason for installing the new train-stop system in this busy territory where some passenger trains are operated at high speeds. The streamliner "Twin Cities 400" makes the approximately 400 miles between Chicago and St. Paul-Minneapolis in about 400 minutes—hence its name. Included are six scheduled and three conditional stops. Speed is restricted within the limits of Chicago, Racine, Milwaukee and other cities and towns, as well as on some curves. Where speeds are not otherwise restricted, the maximum permissible speed between Chicago and Milwaukee (85 miles) is 100 m.p.h. for streamlined diesel-operated passenger trains. On the 142 miles between Milwaukee and Wyeville the maximum is 95 m.p.h. for such trains.

The train-stop project starts at Clybourn Junction, 2.5 miles from the Chicago passenger terminal. The main line has two main tracks for $\frac{1}{2}$ mile between Clybourn Junction and Deering; three main tracks for 10.7 miles from Deering to Wilmette; two main tracks for 122 miles from Wilmette through Milwaukee to Clyman Junction; and one main track 102 miles thence to Wyeville.

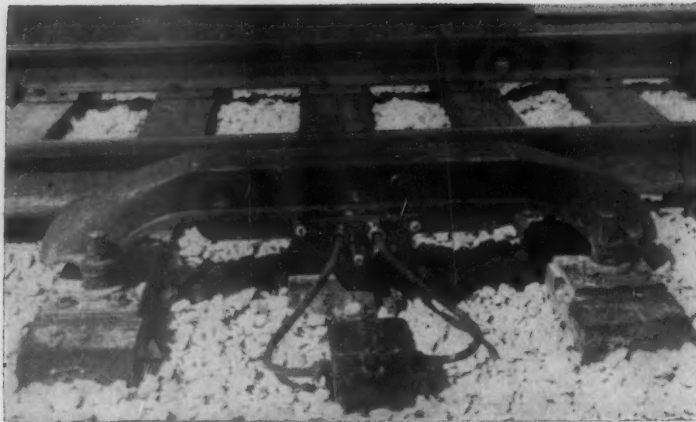
A Busy Stretch of Railroad

The scheduled passenger traffic includes 47 trains between Clybourn and Evanston, 9.1 miles; 40 trains between Evanston and Waukegan, 23.9 miles; and 14 trains between Waukegan and Milwaukee, 49 miles. An average of five freight trains are operated daily over various sections of this main track between Chicago and Milwaukee. (Most freight trains operate between Proviso and Milwaukee on a separate freight line.) On the 50.5 miles of double track between Milwaukee and Clyman Junction, the daily traffic includes the "400" streamliner each way, one other passenger train each way, and about eleven freight trains each way daily. On the 102.4 miles of single track between Clyman Junction and Wyeville, the traffic includes the "400" streamliners and the "North Western Limited" each way, as well as an average of 12 freight trains.

That part of the train-stop equipment installed on the



RECEIVER mounted on a journal box on each locomotive so that it passes over . . .



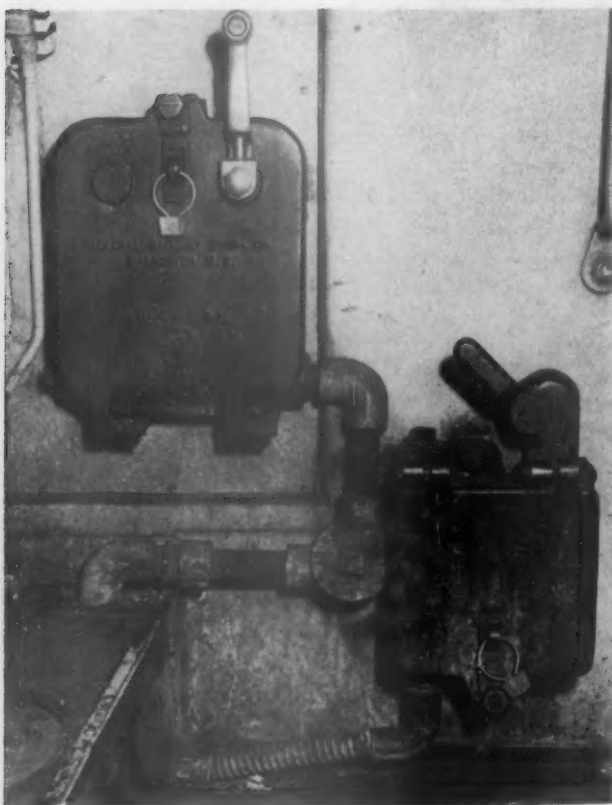
WAYSIDE INDUCTOR which is installed at the right of the track adjacent to each signal.

wayside consists of an inductor unit at each automatic and interlocking main-track signal. Each of these inductors is 7 in. wide and 45 in. long, and is mounted to the right of the track, in the direction of train movements, on two new 7-in. by 9-in. by 9-ft. 6-in. hardwood treated ties, spaced on 40-in. centers, with ends extending 3 ft. from gage. Plates and adjustable washers are provided on which the inductor is mounted to bring its center line 19½ in. from gage, and the top surface 2½ in. above the level of the top of the rail.

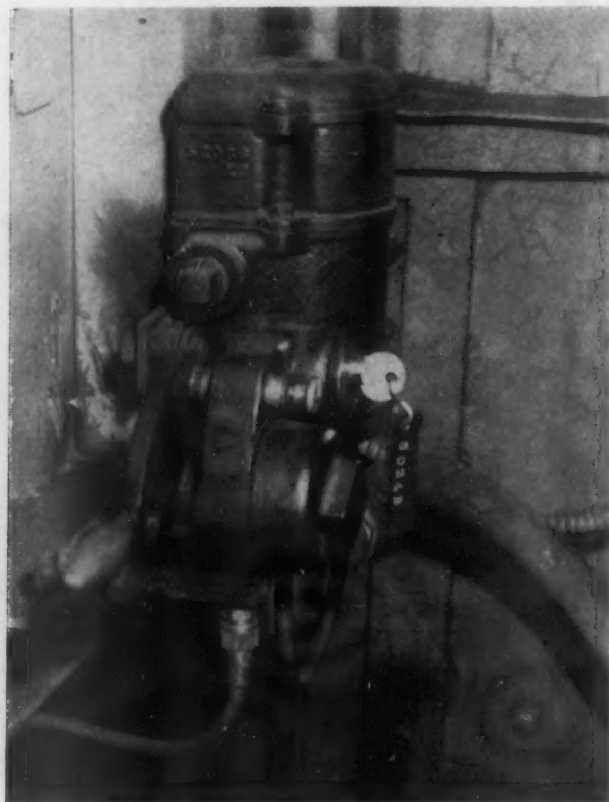
The train-stop equipment on each locomotive includes a receiver mounted so that it passes directly over each

wayside inductor. On diesel locomotives the receiver is on the rear journal box on the front truck. On steam locomotives the receiver is on the rear journal box on the front truck of the tender.

If a signal is displaying a "top-arm" high green aspect, contacts in the signal relay (or repeater) are closed to connect the two wires from the inductor, thereby making a closed circuit including the coil of the inductor. When thus connected, the receiver of a passing locomotive inductively receives a "clear." On the other hand, if the signal displays other than a "top-arm" high green, the receiver of a passing locomotive is actuated to effect



ENGINEER IN HIS CAB can easily reach acknowledger (left) or reset lever (right).



THIS CUT-IN VALVE must be placed "normal" and the key given to the conductor before leaving terminal.

controls to apply the brakes, unless the engineman acknowledges. If the engineman is alert, and desires to avoid a stop at a signal displaying an aspect other than "top-arm green," he may operate his acknowledging contactor.

If the engineman does not "acknowledge," the brakes are applied to stop the train. After such a penalty brake application is received, the engineman can operate the lever of his reset device, which includes a clock-work time-release that introduces a delay period, at the termination of which the brakes are released. The time delay period is 1 minute on passenger trains and 2 minutes on freight trains, which is sufficient to stop the train.

Conductor's Responsibility

A special C&NW feature is that the conductor of a train has joint responsibility, with the engineman, to know that the train stop is in service on the locomotive during a run. This result is accomplished by a special cylinder-type lock. In the locomotive is a cut-in valve, which feeds air through the train stop electropneumatic valve. This valve must be in the "train-stop" position to withdraw the key, and rules require that this key be in the possession of the conductor during the run of the train between terminals.

The automatic train-stop system is in service on all passenger trains, including the numerous suburban passenger trains operated in the train-stop territory. Likewise, train-stop equipment is in service on all diesel

freight locomotives. Steam freight locomotives are not equipped because they will be replaced with diesels in the near future.

Applied to 147 Power Units

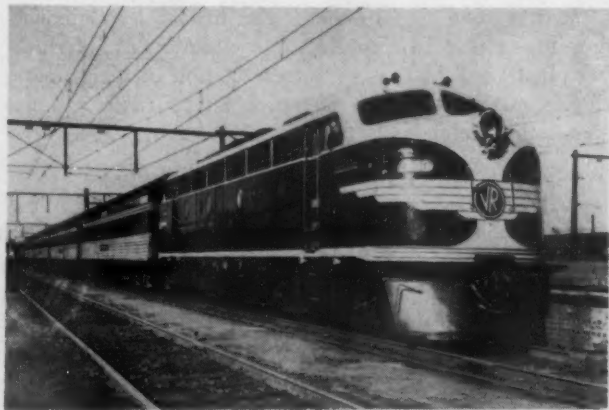
For passenger-train service, train-stop equipment has been applied on 89 steam locomotives, 56 diesel locomotives and 2 rail cars. For freight service, train-stop equipment has been applied on 115 diesels and 19 diesel switchers. These locomotives are in a pool, and are operated not only in train-stop territory but also in other territories. The cost of installing train-stop equipment on the 279 locomotives and 2 rail cars was approximately \$1,400,000, and the estimated annual maintenance of this equipment is \$85,000. The cost for materials and field construction of the wayside portion of this train-stop system was approximately \$375,000; additional signal maintenance costs are estimated at \$22,500 annually.

This train-stop project was planned and installed by C&NW forces. The wayside portions of the system were installed under the direction of S. E. Noble, assistant chief engineer, communications and signals, and under the supervision of E. W. Horning, assistant engineer. The equipment on the locomotives was installed under the direction of J. C. Stump, chief mechanical officer, and under the supervision of L. E. Legg, electrical engineer. The train-stop equipment and new relays at the signals were furnished by the General Railway Signal Company.

Diesel Power for Victorian Railways

Delivery of twenty-six 1,500-hp. diesel-electric locomotives to the Victorian Railways in Australia has begun. The locomotives are a part of the railways' current \$225,000,000 rehabilitation scheme, "Operation Phoenix."

Electro-Motive Division of General Motors Corporation, La Grange, Ill., supplied the power units for the locomotives. The Clyde Engineering Company, Sydney,



THE FIRST of the 26 Victorian Railways main-line diesel-electric locomotives at the Spencer Street Station in Melbourne, Australia.

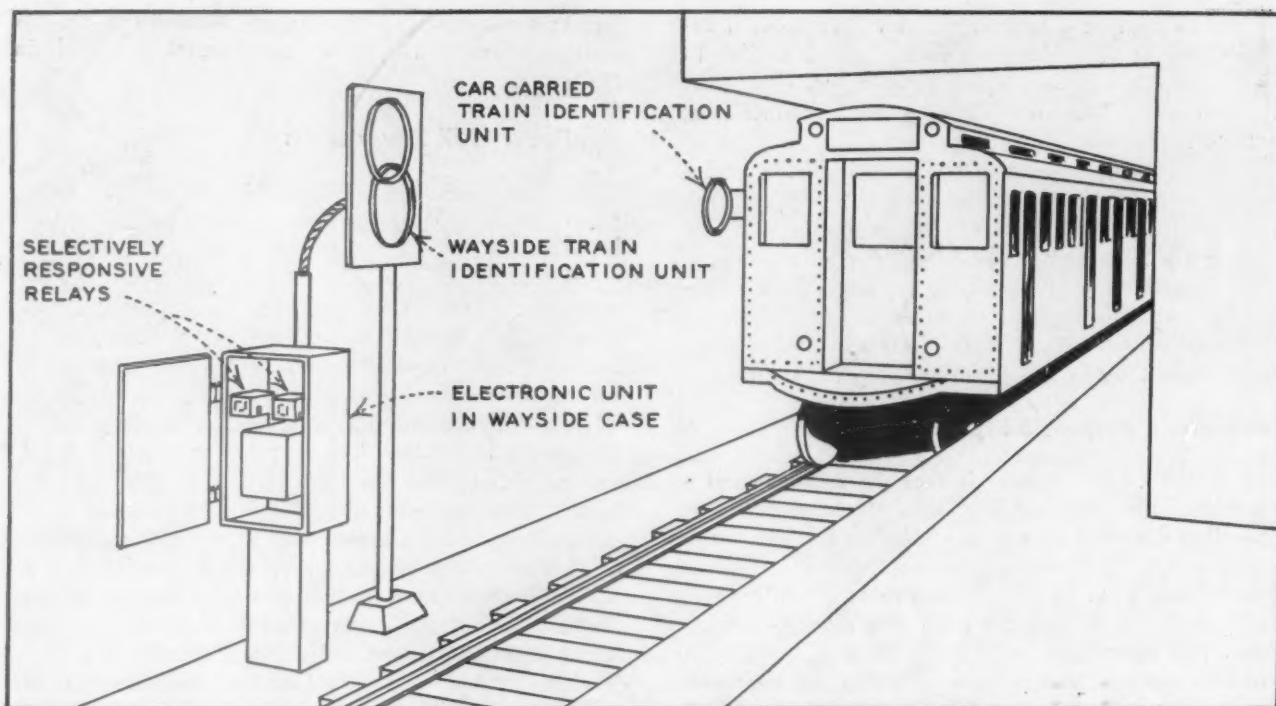
PRINCIPAL LOCOMOTIVE CHARACTERISTICS

Weight (fully loaded)	240,000 lb.
Starting tractive force	60,000 lb.
Continuous tractive force	40,000 lb.
Speed at continuous rating	11 m.p.h.
Maximum permissible speed	83 m.p.h.
Gear ratio	59/18
Number of driving wheels	12
Wheel diameter	40 in.
Fuel oil capacity	1,000 gal.
Lubricating oil capacity	165 gal.
Cooling water capacity	185 gal.
Sand capacity	16 cu. ft.
Truck centers	34 ft.
Truck rigid wheelbase	13 ft. 2 in.
Length between coupler pulling faces	60 ft. 10 in.
Height above rail level	14 ft.
Width overall	9 ft. 9 in.

New South Wales, built the trucks and the bodies, and also installed the power units and accessories.

Use of the new locomotives began in interstate fast freight service between Melbourne and Ararat, and also on the North-Eastern line. With delivery of five units regular assignment is possible to the "Overland" passenger express and the interstate fast freight trains between Melbourne and Serviceton on the South Australian border of Victoria.

The new units have six traction motors with a cab at each end, and are equipped for multiple-unit operation and dynamic braking. They are powered by a 16-cylinder, 2-cycle, 1,500-hp. General Motors diesel engine.



TRAIN IDENTIFICATION system can be applied in rapid transit, as shown in this schematic diagram with tune coil

mounted on the leading car to ride by detecting "bridge" mounted on wayside mast.

Toward the Automatic Railroad

Unless more efficient means are devised for carrying suburban passengers and commuters, such service will become a greater burden on the railroads

By COL. S. H. BINGHAM, A.U.S. (Retd.)

Chairman Board of Transportation
City of New York and Consultant to the
Long Island Transit Authority

Every railroad in the country—main line and rapid transit—is faced with increasing and more vigorous competition every day. The only way to keep ahead of this competition is to exploit the inherent advantages of rail transportation, and to continue to provide the best service at the lowest cost. The Board of Transportation, the operating agency for the city-owned transit system in New York city, has done some advanced thinking along the line of railway mechanization that should be of interest to all railroads.

The rapid transit lines of the New York transit system carried three times as many passengers last year as all of the Class I railroads in the United States combined. This was done with about one-third as many passenger-carrying cars running over 728 miles of track. These operations were controlled and protected by nearly

two billion signal operations. This intensive use of rapid transit facilities—with trains carrying 2,500 to 3,000 passengers running at intervals as short as 90 seconds—has to a large extent been made possible by the development of a good signal system. The further developments now under way in signaling, consolidation of interlocking plants, and increasing automatization of train operation, show the direction in which all railroads can use signaling developments to help meet competition.

Train Identification

One development which is expected to improve the reliability of our operations is an inductive train-identification system. This system could be the basis of some interesting developments on all types of railways.

With rapid transit trains for different destinations, operating at close headway on the same track for part of their run, a system of train identification is essential. This is now done by schedule, colored marker lights, and telephone communication between towers. This system,

while usually functioning well, is occasionally subject to human errors, thereby impairing the service. These difficulties could be overcome by installing an automatic train-identification and route-controlling system which has been developed, and is now on the market. This system will automatically operate the track switches, and set signals for the proper route. Also, the system could be used to "trigger" devices to make train announcements on station platforms either by loudspeakers or illuminated signs.

Train Equipped with Inert Coil

Each train to be identified would be equipped with an inert coil, without power connection, tuned to a specific frequency such as 30 kc. Each frequency represents one train classification. Along the right-of-way at the points at which the identification is to be made there would be a "bridge," tuned to each of the identifying frequencies. As a train passes the identification point, the coil on the train would unbalance the corresponding "bridge" and activate the equipment to identify the train, and to operate the signal, the switch and other devices. This principle has been incorporated in the recently-installed Stockholm subway in Sweden, which was equipped with the most modern American signaling system.

A study of one 7.9-mile line of the New York city transit system indicates that the installation of this identification system, and the automatic operation of switches, would eliminate the need to man at least seven interlockings, out of a total of ten, as far as train selections are concerned. Eight of these ten plants now operate on a 24-hour basis; therefore, the potential manpower savings are evident.

Applicable in Car Accounting

We even visualize possible use of this train-identification system as an integral element of our car statistics operations. Because of the multiplicity and complexity of the mechanical, electrical and pneumatic equipment on a rapid transit car, frequent scheduled inspections on a mileage basis are essential. Records of train arrival and departure are also needed. At the present time, in order to obtain the desired mileage and operating information, employees at terminals and other junction points make a record on train sheets of car numbers, train run numbers, times of arrival, etc. In turn, data from these train sheets must be recorded and processed to obtain the car mileage and other data.

Board of Transportation engineers have for a number of years been working on means to obtain all of the above information automatically. With recent developments in electronic and magnetic devices, and by an extension of the train-identification system described above, this problem may be solved by using similar devices to collect the required data, and transmit it to a central office on one pair of wires covering all points, where it would be placed on automatic recording machines. Thus the car mileage and other records would be available, and up-to-date at all times—and with a considerable reduction in personnel and cost. They would be more accurate than those compiled under present methods, and would give us better assurance that all scheduled inspec-

tions are made in accordance with the mileage requirements.

While such a detailed identification and recording system would not be justified for keeping main-line railroad passenger-car records, an analogous system might be developed for expediting freight-car movement.

In Suburban Service

Corresponding improvements must be made in railroad suburban and commuter services. These services may become more important to railroads serving metropolitan areas for two reasons. As the air lines take a larger share of luxury and long-haul customers, and buses get their share of the shorter-haul low-cost riders, commuter and suburban service may become a greater part of their passenger business. The rapid growth in suburban population is increasing the potential number of riders.

Unless more efficient means are devised for carrying these passengers, this type of riding will become a greater burden on the railroads. Modeling this type of service on rapid transit operations is the way to reduce manpower requirements and costs, with application of the ideas described for more automatic control and operation.

Quite conceivably a system could be developed for automatic passenger origin and destination identification, based on tokens that are coded by a method related to the train-identification system. These could be checked by automatic "passimeter-like" devices and would eliminate the present clumsy ticket collection and cancellation procedure and substitute an automatic control system with large savings in train personnel, and would furnish better records.

Perhaps a train-identification system might be used to modify conventional centralized traffic control, or for control of trains in other than rapid transit operations, and could be a factor in the automatic railroad of the future.

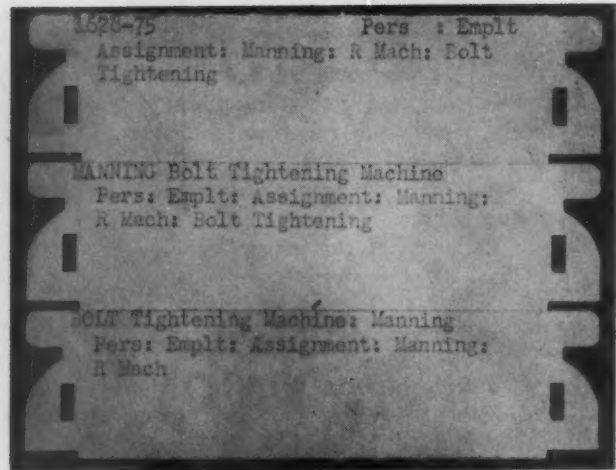
A reduction in freight-train time must be achieved to meet competition. One direction of investigation could be along the lines of moving the freight in smaller units—the number of cars per unit depending on the volume of freight bound for any one destination after perhaps only one classification. Each unit would be self-powered, and automatically guided to its destination by a train-identification system similar to the one described. If the movement is made over a railroad protected by a suitable and properly designed signal system, there is no real necessity for manning either these units or the points of junction of the routes to the various destinations.

Must Support Technical Development

While this may seem a dream for the remote future, the theory to accomplish it is developed. Only practical development of devices and adaptation to railroad operation is needed. The railroads must stimulate and support such technical development, even though it may seemingly stray far afield of immediate practicability. So often the "dream" of today has become the reality of tomorrow with the scoffer being the "hitch-hiker" instead of the driver.



"KOMPACT" FASTENERS hold files placed in one-inch expansion folders. This prevents the tearing and dog-eared that comes with the use of stapled, open files.



SAMPLE CARDS from the "Chainindex" relative index file, showing how the cards are joined for typing, and how subjects are cross-indexed.



WORD-SUBJECT FILING demonstrated in a typical file drawer. The stripes on each index tab are of different colors; each color indicating a general subject division.



THE "CHAININDEX" UNIT used for the relative index file enables a clerk to find quickly where a file on any subject might be located.

"Word-Subject" Filing System

Consolidated file bureau set up at Springfield, Mo., by the Frisco to obtain higher efficiency and justify latest labor-saving equipment

Greatly improved general office efficiency is claimed by the St. Louis-San Francisco as the result of its completely redesigned and consolidated file, typing and mail bureau at its general offices in Springfield, Mo. The bureau recently was moved into new quarters, designed for maximum efficiency and equipped with the latest

time and labor-saving equipment. At the time of the move, a shift-over to a "word-subject" filing system from the numerical system of classification was undertaken. Although the new bureau layout has not resulted in any direct savings in expenses, the Frisco management believes that the cost of the installation has been more



TRANSFER CART used for delivering and picking up mail and dictation. Proper files are matched with incoming correspondence before it is delivered.

than compensated for by the improved efficiency made possible in other offices throughout the general office building serviced by this bureau.

The new quarters cover 3,427 sq. ft. of the first floor of the south wing of the general office building in Springfield. The bureau handles all mail, filing and stenographic duties for the general manager's office, chief engineer, superintendent of motive power, general superintendent of transportation, superintendent of freight claims, car accountant, assistant auditor of disbursements, and superintendent of communications and signals. All files for these offices are consolidated into one large file in the bureau; there are no individual files within each office. Likewise all stenographic and duplicating work for these offices is handled by the bureau. Only the traffic and general claims departments maintain independent files and stenographic forces.

The filing portion of the bureau is now equipped with a total of 326 five-drawer 10-in. by 14-in. steel filing cabinets furnished by the General Fireproofing Company and six Remington Rand "Chaindex" files for the master references files. The filing cabinets are arranged back-to-back in rows of 18 cabinets with 3-ft. 6-in. aisle space. The file area is liberally illuminated by overhead fluorescent light units spaced at 9-ft. intervals over the aisles. The stenographic portion of the bureau has 17 stenographic desks plus a desk and work table for a supervisor, all likewise furnished by General Fireproofing.

Mail is sorted and handled on a table measuring 12 ft. 8 in. by 4 ft. 2 in., placed adjacent to a pneumatic tube station and a six-bag mail pouch sorter rack. A Model 450 Mimeograph machine is located nearby for use by the mail section.

"Word-Subject" Filing

At the time of the move into new quarters, a portion of the files were converted from a widely used numerical system to a "word-subject" system developed by Remington-Rand.

The word-subject filing system is based on the use of key words to describe a subject, these being arranged

EQUIPMENT PURCHASED TO SET UP THE NEW FILE BUREAU:

- 326 No. 5505-L five-drawer, letter-size "Super-File" filing cabinets manufactured by General Fireproofing Company
- 16 "Line 1600" typewriter desks manufactured by General Fireproofing Company
- 1 Specially-built mail rack by General Fireproofing Company
- 11 Soundscribe dictation transcribing machines (Two were already owned making a total of 13)
- 44 Soundscribe recording units
- 18 Standard Remington typewriters
- 2 Electric typewriters with standard 10-in. carriages from International Business Machines Corporation
- 6 Electric typewriters with 18-in. carriages from International Business Machines Corporation
- 10 Sorting tables from Remington-Rand
- 6 "Chaindex" filing cabinets and table from Remington-Rand
- 1 Model 450 electric Mimeograph machine from the A.B. Dick Company
- 10 Slotted-punches from Remington-Rand
- Assorted tables and desks from General Fireproofing Company
- Miscellaneous filing folders, dividers, and supplies from Remington-Rand

alphabetically in the file drawers. The "dominant" word is placed first, followed by subgroupings described by subsequent words. Nouns and adjectives are used almost exclusively. Single words are used wherever possible.

Thus a file on diesel locomotive traction motor bearings might be listed:

LOCOMOTIVES: TRACTION MOTORS: BEARINGS

To aid clerks in finding the proper file, a "relative index" file is maintained in six Remington-Rand "Chaindex" cabinets. This lists all possible phases related to any given subject and designates where each is filed. This index is designed to aid anyone unfamiliar with the filing system to find the proper file quickly.

In general the subjects have been broken into nine major groups: administration, equipment, finance and accounts, operation, personnel, purchase and supply, road and structures, traffic, and alphabetic name files—each identified by a separate color which appears on the drawer label and on all filing tabs.

As with any filing system, indexing is very important—and very difficult. It requires a comprehensive grasp of all the principles of filing, a knowledge of the material already in the files, and an understanding of the matter to be indexed. For this reason responsibility for all indexing is confined to the chief file clerk in charge of the filing section.

Where files were formerly maintained with a single metal staple in one corner, they are now top punched and kept inside the file folder with a "Kompact" fastener. When files get too large or bulky they are broken into two or more folders by date or subject order. The efficiency of the word-subject filing system has been demonstrated by a marked reduction in the number of files which cannot be found during a day, and by the greater ease with which the file clerks can work the files. At first, only the general manager's files were converted to this system, but files of the other offices are being changed as rapidly as the difficult work can be accomplished. It is estimated the entire changeover may require between 12 and 18 months to complete.



WEATHER IS IMPORTANT IN . . .

Diesel Operations in Canada

Motive power must operate over great distances under difficult and extreme climate conditions without benefit of non-railway service shops

Although Canadian railroads were the first to operate a diesel-electric locomotive in main-line service on this continent, it is only since the opening of the Alberta oil fields in 1927—accompanied by the development of locomotives sufficiently reliable to perform satisfactorily in Canada's climatic extremes—that main-line locomotives have been placed in service rapidly in that country in any numbers.

Since then the two major roads, the Canadian National and the Canadian Pacific, have adopted different methods of utilizing the diesels. Both roads have accumulated much valuable cold weather experience. Temperatures may vary 90 deg. in a few hours, and the total range is from about —50 deg. F. to 100 deg. F.

Prior to 1948, all diesel-electric units for Canada were manufactured in the United States. Since then American manufacturers have adapted their arrangements to the importance of the Canadian market and diesel-electrics are now manufactured in three Canadian subsidiary

plants. At present, the Canadian content of the units varies from 65 per cent to 90 per cent of the total value, and efforts are being made to increase this ratio.

Units manufactured in Canada are of American design with a few modifications to suit climatic conditions. The railways are purchasing 1,500- and 1,600-hp. road units with 4-wheel trucks for freight and passenger service, 1,200- and 1,500-hp. road-switching units for way-freight and branchline service, and 660- to 1,200-hp. units for switching and work-train service.

Since 1943 diesel-electric units of the two railways have accumulated 96,000,000 miles in service, approximately 49,900,000 miles being in switching service. Road service mileage has been accumulated since 1948.

The assignment of diesel-electric road power can be made either to accomplish dieselization of selected runs or complete dieselization of a territory. As explained in detail in *Railway Age*, July 7, 1952, page 148, the Canadian National assigns new diesels to selected high-

mileage runs, where its management believes the greatest return is obtained on the original capital expenditure. The Canadian Pacific, on the other hand, assigns new diesel power to specific fully dieselized territory, with provision for extended service during off-peak traffic conditions. This practice avoids much duplication of steam and diesel maintenance and servicing facilities and permits operating and maintenance personnel to become thoroughly familiar with one type of power.

Electrical Problems Analyzed

The use of diesels in Canada was discussed at length in a paper presented at the winter General Meeting of the American Institute of Electrical Engineers in New York, January 19 to 23, by J. D. Sylvester of the Canadian National and D. F. Haney of the Canadian Pacific, both of Montreal. The authors brought out the following ideas on electrical problems and the remedy.

In Canada institution of diesel-electric locomotive operation has brought electrical problems so far, they explained, because the equipment is comparatively new and because the operation at relatively low schedule speeds does not subject the traction equipment to high terminal stresses or high centrifugal forces.

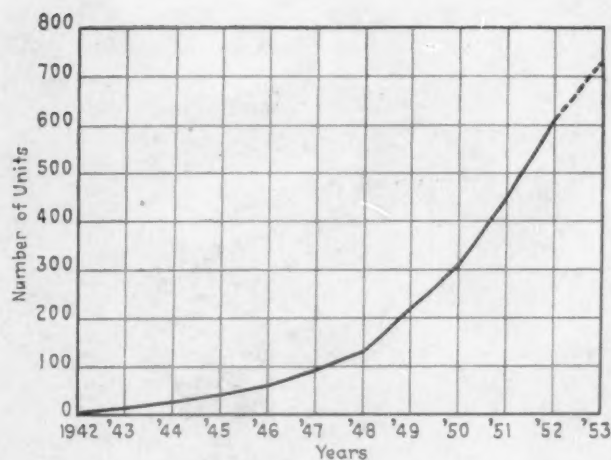
Typical difficulties have been some flashovers on the main generators on one railway, and marked commutator burns on traction motors in the beginning on the other railway. The causes of the flashovers have not as yet been determined definitely. Commutator burns were found to be due to starting freight trains before the brakes were released. This damage ceased when operators were instructed to wait five minutes after releasing brakes before applying power to the wheels.

Unusual Difficulties

Among the Canadian problems which may not be typical elsewhere are those caused by fine dry powdered snow blown by high winds so common in the extreme cold. This snow will pass through filters to build up to a foot and more in the interior passageways of the locomotive and will enter the main generator, traction motor blowers, and electrical control compartments. This results in frequent moisture grounds which are lessened by continuing the operation of the locomotive so that the electrical equipment is dried out by its own generated heat.

Late in the fall, the locomotives are "winterized" to restrict the entry of powdered snow to the most critical areas of the engineroom. Up to 50 per cent of the car body filters are blocked off to reduce the amount of cooling air entering the engineroom. Exhaust openings from the main generator to the outside are closed so as to use recirculated air, rather than fresh air which often carries snow with it.

Outside air along the top of the locomotive has the lowest content of snow. The swirling action of the air along a moving train carries the snow well up the sides of the train. The stream flow along the top is least turbulent and, therefore, least contaminated by roadbed dust and drifting snow. This agrees with experience on intakes for air-conditioned passenger cars and for the traction motor cooling air on the Delaware, Lackawanna & Western electric multiple-unit cars.



HOW MANY DIESELS IN CANADA?

(Data for Canadian National and Canadian Pacific)

Year-end	Number of Steam locomotives	Number of diesel units	Total number of units in service
1942	3,977	5	3,982
1952	3,780	610	4,390

To take advantage of the relatively snow-free air above the locomotive, some units have a roof air intake placed over one of the engine cooling radiator blowers, so baffled that some of the exhaust from the the radiator blowers is drawn into the engineroom with the outside air taken in at this point. The control temperature of this radiator blower is set to have it operate first and so supplement the outside air with preheated air whenever heat is available from the engine cooling radiators. The amount of air drawn through the roof intake will depend upon how many car body filters are blocked off and whether the engineroom shutters are open or closed.

The Canadian railways look forward to further developments to overcome their powered snow problems and the resulting moisture grounds. Any means to reduce air intake and air leakage below or along the side of the locomotive is to be desired. Pressurizing the engineroom and particularly the electrical compartments with clean air would be a step towards this objective. One manufacturer has a means of passing the cooling air from the main generator through a duct with a filter to the electrical compartment to pressurize it.

Some Unique Features

The original Canadian National diesel-electric locomotive No. 9000 had some features not yet available on modern diesel power. Engine air could be taken either directly from the outside or from inside the engineroom, depending upon climate and track conditions. This had the advantage that when air was taken directly from the outside, the amount of snow drawn into the engineroom was much less. The generator was enclosed in a separate compartment free from snow and oily vapor deposits.

In a Canadian winter, the electrolyte of starting bat-



CANADA'S FIRST DIESEL was CNR No. 9000. Rated at 2,660 hp., it was placed in service in 1928, accumulated

one-quarter million miles in revenue service, and was retired in 1946 because of inability to obtain spare parts.

teries is often down to an inefficiently low temperature of 5 deg. F. unless the engines are kept idling when not in an enginehouse. It is the finding of the Canadian National Research Council that a diesel engine cannot be expected to ignite on starting if the engine block temperature is below 20 deg. F. Auxiliary steam generators are of value in winter operation although they have not yet been arranged to heat the battery compartment.

Precautions are taken in cold weather to inspect locomotives indoors as soon as possible after being released from service. The electrical equipment, therefore, does not cool down to the point where condensation would occur across insulated parts when subsequently brought into the shops.

Electric Traction Equipment

In the United States, there are many non-railway shops which major in repairing electric traction equipment. Canada has none to date. The two major railways are, therefore, planning to equip several of the main shops to do these repairs.

These will be staffed by re-assigned personnel, trained for the new work. It is not expected that there will be the advantage of competitive repair costs such as are available in the United States.

The Canadian roads' only schedule for traction motors is the inspection and clean-up at wheel change. This has been satisfactory to date, but insufficient experience has been obtained to establish a definite overhaul interval. Canada's first diesel-electric yard switchers have just

seen 10 years of service. The first diesel road locomotives have just had 600,000 miles of operation in freight service. A definite pattern of life expectancy of traction motor bearings is developing on some Canadian power. Road failures of traction motors have been almost exclusively due to mechanical failures and accidents.

Desired Developments

The Canadian railways have observed with interest recent developments which give better and more reliable locomotive performance. With the improvement in the diesel engine and the reduction in mechanical failures, more emphasis is being placed on the electrical components to insure trouble-free service. Although many automatic controls are necessary, the Canadian spokesmen emphasize the need to make these of few moving parts and to have their functioning as simple as possible.

The use of Class H insulation has increased the continuous rating of the electrical equipment. This allows the railways to use a higher gearing without reducing haulage capacity in heavy freight service. This increase in operating range permits the greater use of a locomotive in heavy freight and in medium-speed passenger service. Further developments along these lines are anticipated.

Recently the capacity of the dynamic brake has been increased, and danger of current overloads has been reduced, by the development of an automatic control to replace the manual control. This will allow greater use to be made of the dynamic brake without burning out the resistors or overspeeding the cooling fans.

Tank Car Time Out Cut 16 to 1

Degassing employs compressed air effectively to remove vapors of gasoline or liquid petroleum gas. Explosimeter determines when air is vapor free

The job of clearing tank cars of vapors after transporting gasoline or liquified petroleum gas has been cut from 16 hours to one hour by the Lone Star Gas Company at Ranger, Tex., using a compressed-air type ventilating device on the bottom outlet and a simple air deflector supported in the dome of the car, as shown in the diagram. The reduction both of man-hours and car tie-up time for inspection and repairs yields substantial savings; safety is said to be increased; there is less interruption to cleaning and repair operations; and workmen are not subjected to the discomfort of high working temperatures produced by steam—in fact, the air flow has a cooling effect.

Special Equipment

Special equipment used in this air-cleaning operation includes a 3-in. MSA-Lamb Air-Mover and a Model 2 Explosimeter, both furnished by the Mines Safety Appliances Company, Pittsburgh. The suction end of the Air-Mover is connected through an adapter to the bottom outlet of a tank car and is aimed in the direction of wind movement if there is any. Air is drawn into the tank through the top dome opening, but without means of directing air flow it tends to channel through the tank without picking up all vapors in the ends.

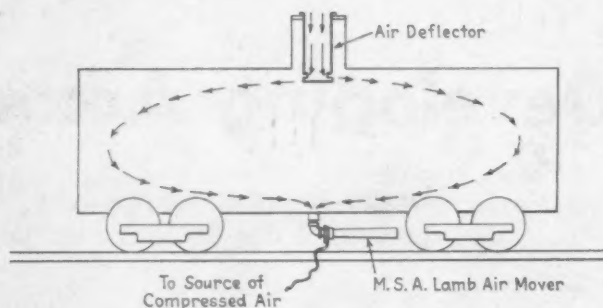
To overcome this limitation, various types of shop-made air deflectors were tried, their relative effectiveness being checked by means of the Explosimeter at regular time intervals. The deflector which finally proved satisfactory is a 14½-in. diameter sheet-metal cylinder 41 in. long with 17½-in. diameter supporting flange on top to rest on the dome opening. The bottom end is closed and two 3-in. by 8-in. openings on opposite sides of the cylinder wall direct entering air toward opposite ends of the tank.

For most effective results, an air pressure of 80 lb. is supplied to the Air-Mover by an air compressor. This moves 660 cu. ft. of air per min. and consumes 72 cu. ft. per min. of compressed air. However, the device is also used successfully at pressures as low as 40 lb. which induces 460 cu. ft. of air per min. and uses 33 cu. ft. per min. of compressed air.

After 20 min. of operation in this pressure range, and at five-minute intervals thereafter, the MSA Explosimeter is used at the discharge end of the Air-Mover to detect the presence of hydrocarbon vapors until a zero reading is obtained. Usually 30 min. of operation is enough for an 8,000-gal. tank car. The instrument is then used inside the tank. Although traces of gas are rarely found, if any is present the deflector is replaced and ventilation resumed. Sometimes scale holds vapors



USING AN MSA EXPLOSIMETER at the discharge end of the Air-Mover to detect the presence of hydrocarbon vapors—The inside of the tank is also tested with the same instrument.



METHOD OF FREEING TANK CAR of vapors with an MSA-Lamb Air-Mover, in which a simple sheet metal cylinder extending through the dome deflects air into the ends of the tank.

and must be removed, especially if welding or other hot work is necessary.

The Lone Star Gas Company's experience shows that no liquid petroleum products should be left in a tank when starting to remove hydrocarbon vapors. Any liquid that remains after draining is flushed out with water to assure effective use of the Air-Mover. Another safety precaution is grounding the horn of the Air-Mover during its use to prevent possible accumulation of generated static electricity. This is usually done by connection with the railroad rail, as illustrated.



RECOGNITION is given "trainees" as top officers of C&O's Chesapeake District accounting department drop in at a "graduation" dinner.

Developing Accounting Officers

Here's the program used by C&O to offset the loss of a large number of key personnel due to retire in the next few years

Since the accounting and treasury departments of the Chesapeake & Ohio are faced with a large number of retirements of key personnel within the next several years, the railroad is pursuing an extensive and intensive program of evaluating and training personnel who will have to fill positions in both the high supervisory and managerial brackets.

The objectives of these programs are, first, naturally, to find people who are potential supervisory and executive timber; and, second, to develop the management concepts (or as the C&O puts it, "Cost, Service, Output") in these persons, to the end that the maximum effectiveness of the departments may be realized in providing necessary management controls. Much of the training effort of the C&O is of course directed along lines indicated by the results of the evaluation program. Thus, there are training courses for groups of persons who

HOW A CANDIDATE IS PICKED AND TRAINED:

1. A line officer recommends him.
 2. Two or more people evaluate him.
 3. He's trained where he's weak.
 4. He's taught higher management problems.
-

have certain needs in common, while individual activity has been set up for still other persons. After receiving the "education" recommended for him, each individual is checked to see what the training has accomplished toward qualifying him for added management responsibility. Plans are that further evaluation of individuals

will be made periodically to see just how much they are "growing."

It is too early to say just how valuable the program has been to the railroad. C&O officers know, however, that it has enabled them to find some "dark horses" who, up to the inception of the program, had never been considered seriously for the positions they ultimately got. In addition, several of the training courses have created a great deal of interest among accounting and treasury personnel, so much so that they have had to be enlarged.

Other Departments' Views

Recommendation of candidates for evaluation is made by line officers of both the Chesapeake and Pere Marquette districts. At the same time, the recommending officers suggest persons who are qualified to evaluate the candidate. More than one person rates each candidate, and insofar as possible persons in addition to his immediate superiors are asked for information. Every effort is made to see that, for example, a young man's capabilities are weighed by someone considerably his senior in age. Also, wherever possible at least one rating is secured from a person outside the candidate's department, preferably someone with whom the accounting or treasury department man has had to deal regularly in the performance of his work.

Evaluators are required to fill out a "Management Evaluation and Development Guide." In the guide, following detailed instructions for filling out the form, are questions about these characteristics of the candidate:

- **Acceptability**—ability to get along with others and maintain their respect and confidence.

- **Analytical ability**—securing and evaluating facts, and from a consideration of all facts thinking out a conclusion.

- **Leadership**—inspiring others to greater determination and unity of purpose.

- **Making decisions**—willingness and ability to arrive at a conclusion on a course of action.

- **Organizing ability**—ability to arrange for the accomplishment of his job in an orderly, efficient manner.

- **Responsibility**—willingness to assume and discharge conscientiously the obligations of his job.

- **Adaptability**—the ability to understand easily, accept and adjust to changes in his working environment.

- **Job knowledge**—the possession of technical or practical information and skill needed to perform (a) his present job and (b) the job for which he is being evaluated.

- **General knowledge and understanding**—the possession of general information and understanding needed to carry out effectively management responsibilities, and capacity for broad thinking.

As an aid in answering each of these questions, there is included on the form a list of further questions which may help the appraiser in properly describing the persons he is evaluating. For example, before answering Question 3 (above) pertaining to a person's leadership ability, the evaluator is told to ask himself some of the following questions:

"Does he work through people—providing for a maxi-



FACILITIES conveniently arranged for "students' comfort play an important part in training activities.

7. **ADAPTABILITY**—The ability to easily understand, accept and adjust to changes in his working environment.

Review in your mind the individual's performance in relation to the following questions:

How quickly does he adjust to new methods, procedures and routines? Does his adjustment involve any emotional disturbances, or does he take it in his stride? Does he cling to obsolete or outmoded ideas and theories; or does he understand and accept new, approved and tested developments? Does his attitude to the Department, its leadership, and his co-workers aid or hinder his willingness to accept new ideas? Does he show that he clearly recognizes and accepts the need to improve clerical methods?

Now check the one of the following that most accurately describes the individual:

- ☐ Has demonstrated his ability to accept a new situation readily and modify his plans and actions in an efficient manner.
- ☐ Dislikes the idea of change and somewhat reluctant to adopt new ideas, even when the necessity has become apparent.
- ☐ Has great difficulty in recognizing need for change; tends to take a defensive attitude.
- ☐ Is recognized as being outstanding in his ability to accept a new situation and adjust himself quickly.
- ☐ Recognizes change in a situation and makes satisfactory personal adjustment.

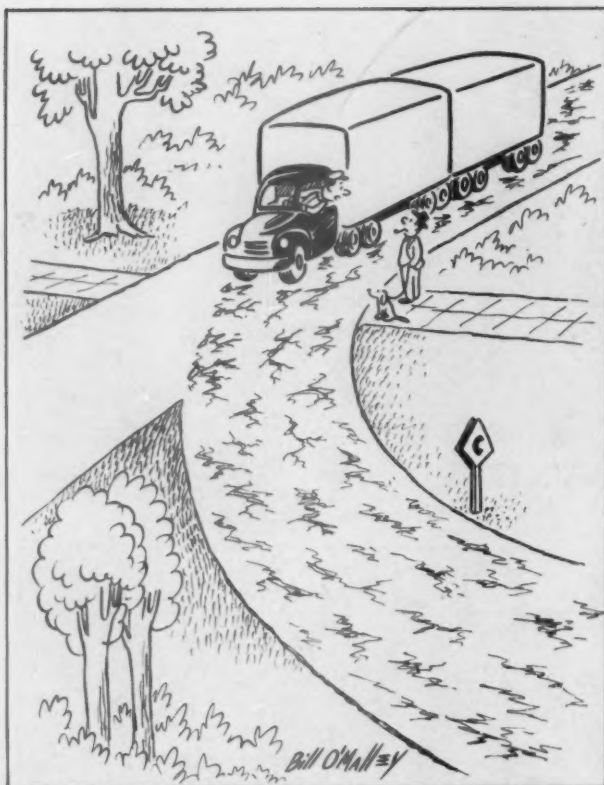
A PAGE taken from the C&O's management evaluation and development guide.

mum of participation? Does he seem to have a sincere interest in people? What about the morale in his department? . . . Does he give credit where credit is due? . . . Is he a 'driver' or a 'leader'? . . . Is he sensitive to the needs of his subordinates, or other contacts?"

Room is provided also for the person filling out the questionnaire to record specific reasons for the rating given the man. Interestingly enough, although the evaluator is asked to check items which indicate the person's characteristics, the listing of those characteristics does not always proceed from the best to the worst, or vice versa, so that merely checking off the first listing in the series assures the candidate neither the best nor the worst possible rating.

Also a part of the guide is a two-page "evaluation summary" which the evaluator is required to fill out. One of the questions which he must answer is "For what other position (other than the one for which being evaluated) does he appear to be a candidate?"

When evaluators indicate that men need certain types of training the candidates are given it. For example, many men were found to need some sort of training to give them assurance and poise. Frequently these persons are given a course in public speaking. For persons who seem to have some other weakness, sometimes participation in American Management Association seminars is the prescribed answer. Persons needing tax work have



"HEY, BUB, which is the truck route?"

been sent to various universities to take tax courses. Other means used to train personnel are personal coaching by the man's superior or an associate; rotation of assignment; assignment to a committee; informal or formal company training courses; membership in professional associations; visits to other railroads or industrial firms. In addition, libraries containing selected magazines, books, etc., have been set up at strategic points along the railroad (Richmond, Va.; Huntington, W. Va.; Detroit, etc.).

Among the formal training courses which have been set up by the railroad are public speaking; basic accounting; freight claim investigation; work simplification; and rate classes. In some cases attendance is on company time, in others the employee gives up his own time. Manuals have been provided in some of these cases.

One of the training courses given by the C&O's accounting and treasury departments is in "management." A series of eight management conferences is held, with groups of 8 to 15 supervisors in attendance. Such a meeting is by C&O definition "... a planned and systematic, yet informal, discussion of a current supervisory-employee problem common to members of a group meeting for its consideration—a problem in which the participants are interested and experienced and for which they are collectively seeking a usable solution with the guidance of a competent leader." Leaders of these discussions are picked by the general auditor of the district in which held. (No "brass" from Cleveland ever attends.)

The general objective of the management meetings is, to quote the manual for the Chesapeake district, "to develop in supervisors an understanding of the broad human relations aspects of management responsibility, and

to develop on their part the ability to make this understanding effective by recognition and thinking through of problems, as a basis for the taking of action." More specifically, the C&O wants its supervisors to get a clear picture of their duties and responsibilities.

Another of the announced objectives is "to identify the common 'people' problems that are met in carrying out these duties and responsibilities." A third reason for establishing the course is to pool the thinking and experience of the group in analyzing the problems mentioned in the first two objectives, so their significance may be evaluated and their causes determined; the supervisor thereby will know better what he's in a position to do about these and similar difficulties.

Another thing the C&O hopes to accomplish through these conferences is to establish the supervisor's confidence in his ability to analyze situations, take appropriate action, deal with people and do a better management job. Finally, the conferences provide an opportunity for getting group recommendations on policy or methods and procedures changes which would minimize or eliminate some of the causes of specific personnel problems.

Complete Manuals Supplied

A rather detailed manual for the guidance of the management conference leaders has been provided. Setting up the manual followed a series of conferences between the personnel officers of the accounting and treasury departments, an outside consultant and the chief line officers of each district. Essentially, therefore, the program represents the local forces' estimates of what they deem important from a management viewpoint.

It is interesting to note that some differences exist between what the Chesapeake district people put on their program and what the Pere Marquette group thought should be discussed. On the Chesapeake district, for example, one of the eight conferences deals with "The supervisor's responsibility for on-the-job training of employees." On the Pere Marquette district this subject was taken into account as part of another subject, "What can the supervisor do about the quality of employees being hired?" However, there is enough similarity in the two outlines to bring out clearly that the supervisors on both districts have pretty much the same problems in this respect.

Minutes are kept of all meetings. Expressions of opinion are those of the group, however, and no man's name is attached to any individual quotation. The conference leader, selected from among the persons who helped make up the outline of suggested subjects for discussion, is charged with the responsibility of taking up with the proper officers any recommendations made by the group. Minutes of the meetings seem to indicate that discussions have been enthusiastic and that in their recommendations the supervisors have spared neither the management nor themselves. For example, in a session on the supervisor's responsibility for getting reports out on schedule, the group recommend more follow-up on the part of the individual supervisor, and they recommend that "brass" schedule visits to installations so as not to conflict with report schedules of the supervisors' offices.

New Crane travels 20 M.P.H.

REPAIR and maintenance operations on the Toledo, Peoria and Western Railroad are being speeded up by the addition of a new 50-ton locomotive crane. Manufactured by Industrial Brownhoist, it is powered by two Caterpillar D337 Engines, each delivering 219 HP at 1800 r.p.m., and direct-connected to DC generators.

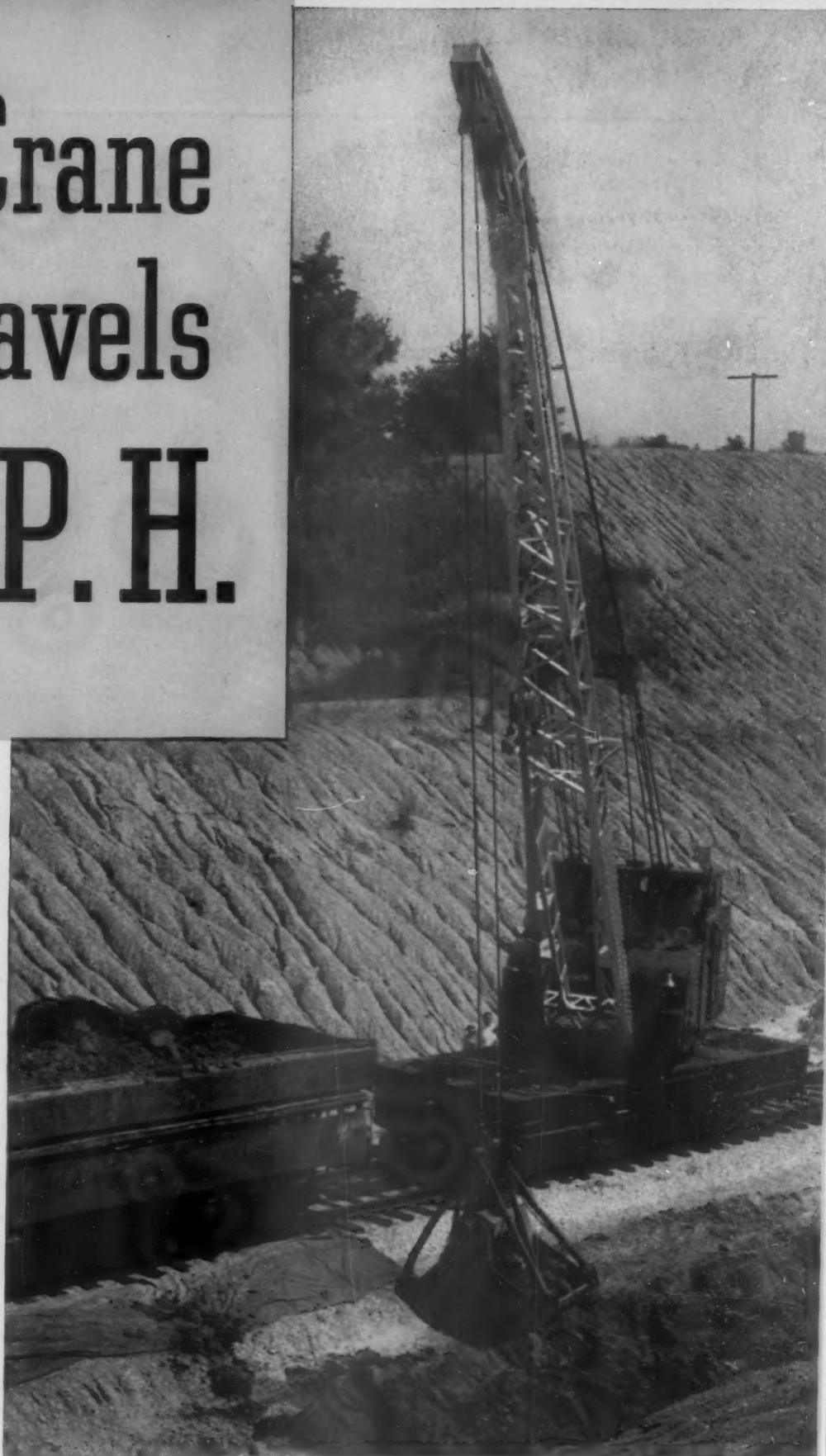
With traction motors driving both front and rear trucks, the crane can travel at 20 m.p.h. running free, or 4 m.p.h. with a 24,000-pound tractive load. Except when moving at high speed, only one engine-generator unit is used. Mechanical energy for handling the 55-foot boom and 1½-yard bucket is taken from an extension of the generator shaft.

If higher speeds are desired, the second engine is switched in and each generator feeds one of the two traction motors. This gives the crane maximum speed and full utilization of the power available.

J. J. Dailey, Superintendent of Motive Power for the T.P.&W., expects the new crane to reduce materially the lost time involved in moving the work train to a siding while scheduled trains pass on the single-track main line.

More and more railroads are specifying Caterpillar power in locomotives, cranes, shovels, air compressors and other equipment. Leading manufacturers use Cat Engines as standard power in the machines they build. And the same dependable units are available as replacement engines.

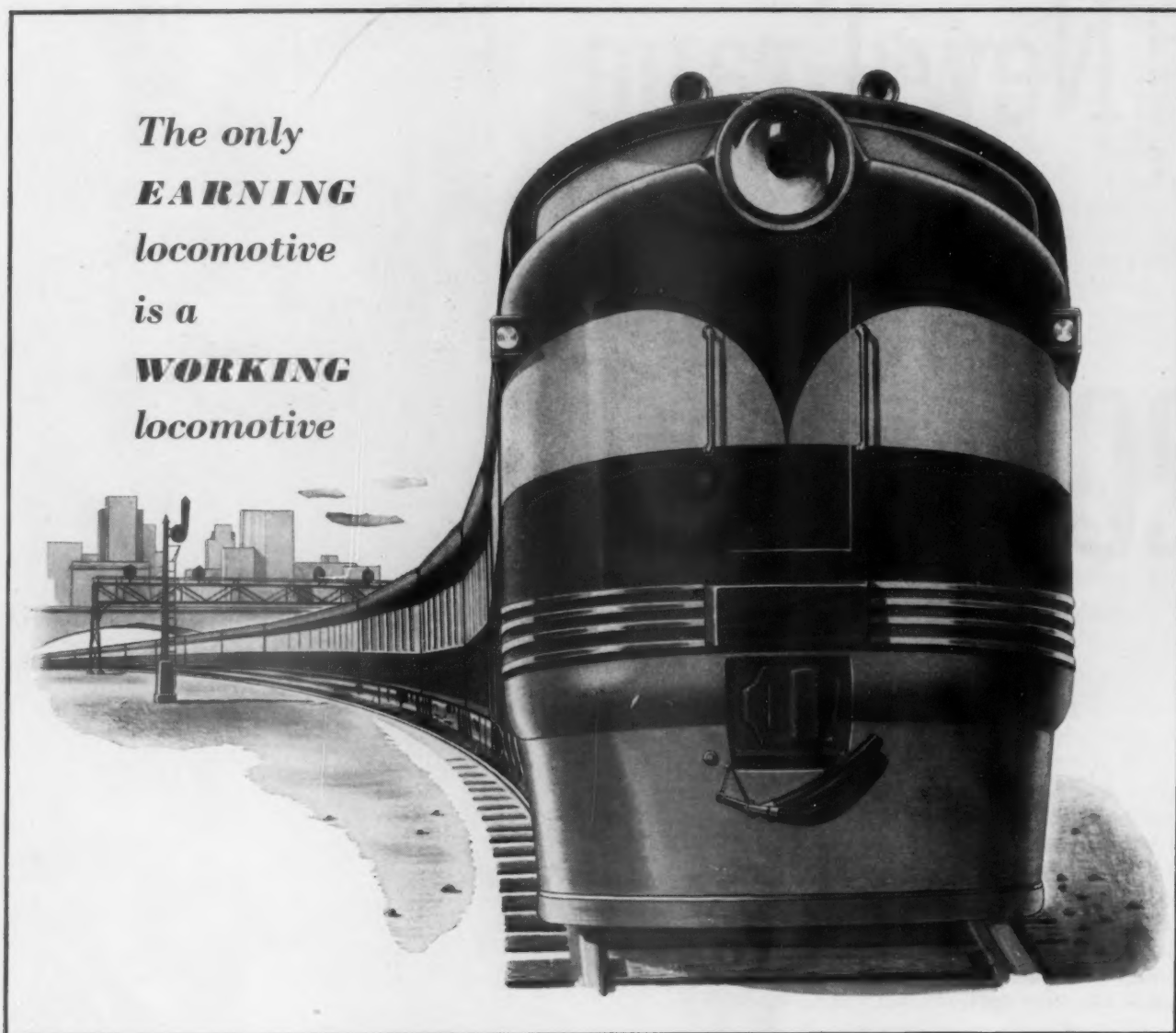
CATERPILLAR, PEORIA, ILLINOIS



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**Railroad
Diesels**

*The only
EARNING
locomotive
is a
WORKING
locomotive*



and Harrison cooling helps to keep them earning

There's a sound reason why most of the Diesel locomotives in service on American railroads today are equipped with Harrison radiators and oil coolers. It is this—a Harrison-cooled locomotive spends more of its time working. And that is the kind of locomotive that railroad management wants . . . a *working, earning* locomotive.

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1. An Autopositive intermediate is made of the drawing which is to be revised.
2. The draftsman deletes the unwanted parts of this print with a razor blade.

3. From this, another Autopositive intermediate is made.

4. Then the draftsman only has to add the new design . . . and a new "file original" is ready. From it, additional Autopositives can be made for print production.

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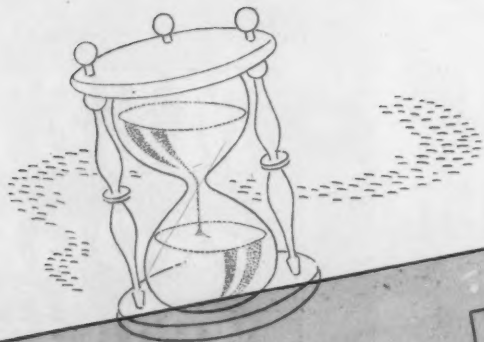
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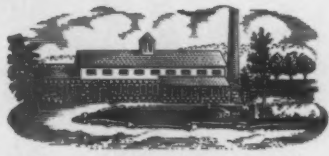


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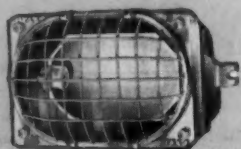
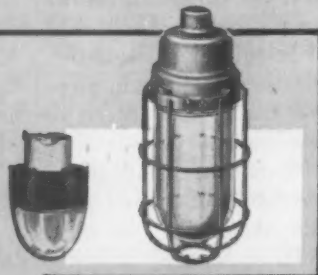


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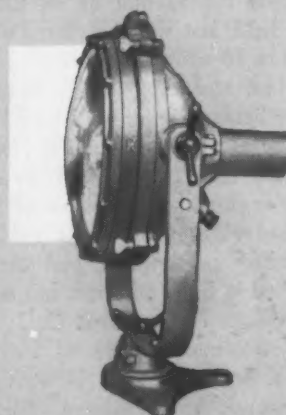


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Reports and addresses presented at convention last week indicated that the association carried on with its regular tasks in addition to preparing for the reprinting of its Manual of Recommended Practice



C. G. Grove
President-Elect



G. W. Miller
Vice-President

A.R.E.A. Meeting Climaxes Year

The work involved in making recommendations for "modernizing" 500 documents, some of them highly technical, might be thought to be sufficient to keep an entire organization busy for a full year, leaving little or no time for any other constructive work. But the standing committees of the American Railway Engineering Association have not only accomplished this feat as part of the work of bringing the association's Manual of Recommended Practice up to date in preparation for reprinting it, but they managed to carry on simultaneously the necessary studies and investigations for making reports on many of their current assignments.

The presentation of reports growing out of these activities of the association's 22 standing committees (and its one special committee) constituted the principal area of work on the agenda of its fifty-second annual convention, held last week at the Palmer House, Chicago. In addition 16 addresses were presented during the three-day session, and 17 meetings and luncheons of committees were held, all highlighted by the single major social event—the association's annual luncheon.

The fact that the A.R.E.A. is continuing to grapple with the engineering problems of the railroads with undiminished vigor is not only evident in the reports of the standing committees, and the addresses that were sandwiched in between them, but was brought out clearly in the reports of President C. J. Geyer, vice president (construction-maintenance of way) of the Chesapeake and Ohio, Secretary N. D. Howard, and the association's new treasurer, A. B. Hillman, chief engineer of the Chicago & Western Indiana.

Reporting briefly on the welfare of the association, Mr. Geyer said that "it is physically and financially sound," and that it has shown "its usual progress during the past year." He then went on to show how this

progress is dependent on the activities of the committees and the individual members. The making of an assignment to a committee, he said, "is the start of a report that may mean much or little to railroad engineering knowledge. It all depends on the committee workers." Noting that the committees are composed of railroad officers from presidents down to the youngest subordinates, and that they include representatives of allied industry, colleges and private engineering firms, Mr. Geyer raised this question: "Can you conceive of a group better qualified to handle a railroad problem particularly with a free rein to each member." It is his opinion that the A.R.E.A., under this system, "has in the past and will in the future develop the finest standards, methods and practices that can be devised for railroad purposes in the engineering field."

A Word to Top Management

Addressing himself to top managements on the question of the value of the association's recommended practices to the railroads, Mr. Geyer said that "many of you are not A.R.E.A. members or familiar with the potential savings to your road if it uses the standards set forth as recommended practices in the A.R.E.A. Manual." Asserting that every railroad on the North American continent is represented in the association by at least one officer, he urged those executives who are not familiar with the value of the association to their railroads to acquaint themselves with its work through their representation in the organization.

Mr. Geyer then mentioned the current project for overhauling the association's Manual "from cover to cover." He said that "your committees have assembled a Manual of railroad construction and maintenance that is un-



G. M. O'Rourke
Vice-President-Elect



N. D. Howard
Secretary



C. J. Geyer
President

of Hard Work

equaled by any other reference of its kind." Then, addressing his concluding remarks to the junior members of the association, Mr. Geyer said that "you will be the association of tomorrow and it will be a sore disappointment to your predecessors if you do not make it more useful than the association of which we are so justly proud today."

Reporting on the general health of the association, as reflected in the trend of membership and in the character and scope of its activities, Secretary Howard said "membership in all categories has again increased; the total personnel serving on committees has still further enlarged; research efforts have been further broadened and expanded; and the work of committees, as measured by the number of printed pages of reports in the bulletins, and especially by the amount of Manual material offered for adoption, reapproval, or revision, has been unusually intensive and productive; and receipts have again exceeded disbursements."

Mr. Hillman, reporting as treasurer, said that receipts of the association during the past year, totaling \$77,514, showed an excess over disbursements of \$550.

A general review of developments in research being carried out under the sponsorship of A.R.E.A. committees was presented by G. M. Magee, director of engineering research of the Engineering Division, A.A.R. This address, along with those of Messrs. Geyer, Howard, and Hillman, was delivered at the opening session on Tuesday. Mr. Magee referred first to the new mechanical research laboratory being built adjacent to the Central Research Laboratory at Chicago. He explained that the new building "will be used primarily for certification tests of those units which must have A.A.R. approval before they may be purchased for use on freight cars in interchange service."

Mr. Magee described tests designed to determine the possibility of increasing the standard rail length from 39 ft. to 78 ft. "There are many problems," he said, "to be confronted in mill production, principally in connection with cooling and finishing the rail." He also told about attempts being made to overcome shelly rail through tests on photoelastic models; of the use of Sonntag fatigue testing machines in a study of the development of bolt-hole cracks; of tests of tieplates and hold-down fastenings, using a rolling-load machine; and of two new manganese crossings that are being tested in service.

Explaining that research on bridges has comprised approximately one-third of the research activities, Mr. Magee told of strain gage readings made on the Santa Fe's Topock bridge; of tests to determine the breaking strength of concrete culvert pipe; of studies on high-strength bolts used in lieu of rivets; and of tests to determine the effectiveness of fire-retardant coatings on timber trestles.

All sessions of the convention were presided over by President Geyer, assisted by Secretary Howard and Vice-President C. G. Grove, chief engineer, Western region, Pennsylvania. The attendance at the convention included 1,253 members and 592 guests, a total of 1,845.

The following officers were elected: President, Mr. Grove; and vice-president to serve for two years, G. M. O'Rourke, assistant engineer maintenance of way, Illinois Central, Chicago.

The directors named are E. S. Birkenwald, engineer bridges, Southern, Cincinnati, Ohio; F. G. Campbell, chief engineer, Elgin, Joliet & Eastern, Joliet, Ill.; B. R. Meyers, chief engineer, Chicago & North Western, Chicago; and G. E. Robinson, engineer structures, New York Central, Chicago. Members of the Nominating Committee are L. T. Nuckols, chief engineer, Chesapeake & Ohio, Richmond, Va.; C. H. Sandberg, assistant bridge engineer, Atchison, Topeka & Santa Fe system, Chicago; E. L. Anderson, chief engineer, St. Louis-San Francisco, Springfield, Mo.; W. H. Giles, assistant chief engineer system—construction, Missouri Pacific, St. Louis, Mo.;



THE BOARD OF DIRECTION of the American Railway Engineering Association in session on March 16, preceding the opening of the convention. Left to right (seated): Ray McBrien, engineer standards and research, Denver & Rio Grande Western; R. J. Gammie, chief engineer, Texas & Pacific; Nancy Campbell, stenographer; T. A. Blair, chief engineer system, Atchison, Topeka & Santa Fe; A. N. Laird, chief engineer, Grand Trunk Western; Neal D. Howard, secretary; H. S. Loeffler, assistant chief engineer, Great Northern; C. J. Geyer (president), vice-president, construction-maintenance of way, Chesapeake & Ohio; C. G. Grove (senior vice-president), chief engineer, Western region, Pennsylvania; G. W. Miller (vice-president), engineer maintenance of way, Canadian

Pacific; G. M. O'Rourke, assistant engineer maintenance of way, Illinois Central; W. C. Perkins, chief engineer, Union Pacific; S. R. Hursh, assistant chief engineer-maintenance, Pennsylvania; Clark Hungerford, president, Frisco; E. E. Mayo, chief engineer, Southern Pacific; left to right (standing): E. G. Gehrke, assistant secretary; R. P. Hart, chief operating officer, Missouri Pacific Lines; W. J. Hedley, assistant chief engineer, Wabash; N. V. Engman, assistant to secretary; M. H. Dick, engineering editor, *Railway Age*. Other members of the board not shown include L. L. Adams, chief engineer, Louisville & Nashville, and A. B. Hillman (treasurer), who is chief engineer of the Belt Railway of Chicago and the Chicago & Western Indiana.

and L. H. Laffoley, engineer of buildings, Canadian Pacific, Montreal, Que.

In addition, G. W. Miller, engineer maintenance of way, Eastern region, Canadian Pacific, Toronto, Ont., and vice-president of the association, was automatically advanced to senior vice-president succeeding Mr. Grove.

On two occasions during the three-day meeting, the program departed momentarily from the purely technical phases of railway engineering activity. One of these occasions was an address at the opening session by James H. Aydelott, vice-president, Operations and Maintenance department, Association of American Railroads, whose subject was "Planning Is Always in Season." The other was the annual luncheon on Wednesday, at which the guest speaker was Dr. Francis Gaines, president of Washington and Lee University, who spoke on the subject "Hand and Spirit."

Long-Range Planning Advocated

"Without adequate planning, some railroads may encounter serious difficulty if there is even something less than a full-scale transition from a wartime to a peacetime economy," declared Mr. Aydelott. At the same time, he feels that "our industry is particularly fortunate in that most of its members have a staff of engineers well qualified by experience to carry out planning activities such as will point to lower costs of operation and maintenance and more acceptable service to patrons."

Mr. Aydelott then described how the diversification of industrial production has enabled some industries to escape serious financial difficulties because of changes in the national economy. He mentioned this "only because

our own industry is severely handicapped in that it has only its service to sell and its efforts to diversify by engaging in other forms of transportation as a common carrier have thus far been unsuccessful."

Several factors that may have a bearing on the future welfare of the railroads were outlined by Mr. Aydelott. One is the present favorable effect on railroad revenues of movements of commodities whose nature and length of haul are "not in keeping with our prewar or normal experience." "Your guess is as good as mine," he declared, "as to how long shipments of this kind will feature railroad traffic here in the United States and thus add materially to the revenues of the carriers as occurred in 1952." Other factors mentioned by Mr. Aydelott as having a bearing on future conditions included the tendency of friendly nations to prefer that any future aid from the United States should be in the form of dollars rather than goods, and the growing severity of competition from other forms of transportation.

"How then are we to plan for the future, which has so many elements of uncertainty which only time will clarify?" Mr. Aydelott referred to the favorable effect of diesel-electric locomotives on train-hour production and then emphasized the fact that, in contrast, the railroads secure something less than three hours of line-haul performance from their freight cars out of each 24. He attributed this situation partly "to the inadequacy of many of the older industrial layouts," which have been expanded over the years "without much thought being given as to whether or not the rail carrier could perform efficient switching service or do it economically." He went on to say that many of the railroads' freight-houses have the "same physical disabilities." To permit

the more efficient and economical handling of less than carload freight, "the relocation of such facilities elsewhere perhaps on a smaller scale is being undertaken by a number of railroads."

Calling attention to the fact that the largest single element making up the operating expenses of the railroads is that connected with transportation, Mr. Aydelott made some suggestions for reducing this expense. He said that the proper blocking of trains permitted by the modern freight yard and the saving in time which is possible through the operation of these yards are such

as to call for the most careful planning on the part of the engineer, "both as to the location and the type of layout which will best fit the traffic volume without delay or congestion."

As to future possibilities, Mr. Aydelott declared that the dispersal of industry in the interest of national security "may make industrial railroads out of those which have heretofore not been of that character." His advice is that the railroad engineer in his planning activities "should not be unaware of this possible shift in industrial production."

Committee Chairmen Listed

Here is a list of the 21 A.R.E.A. standing committees, and its one special committee, giving the chairman and vice-chairman who were in charge of each committee's work during the past year. Directly following the close of the convention, nine of the chairmen (each indicated by an asterisk), having served the regular three-year period, relinquished their duties, and the chairmanship in all but one case was assumed by the vice-chairman. Because of the retirement of the vice-chairman, the chairmanship of the Highways committee will be filled by another member of the committee. The list follows:

Roadway and Ballast—G. W. Miller* (chairman), engineer maintenance of way, Eastern region, Canadian Pacific, Toronto; B. H. Crossland (vice-chairman), assistant chief engineer, St. Louis-San Francisco, Springfield, Mo.

Ties—P. D. Brentlinger (chairman), forester, Pennsylvania, Philadelphia; L. C. Collister (vice-chairman), superintendent treating plant, Atchison, Topeka & Santa Fe, Albuquerque, N.M.

Rail—C. J. Code (chairman), engineer of tests—maintenance of way, Pennsylvania, Philadelphia; B. R. Meyers (vice-chairman), chief engineer, Chicago & North Western, Chicago.

Track—F. J. Bishop* (chairman), chief engineer, Akron, Canton & Youngstown, Akron, Ohio; L. L. Adams (vice-chairman), chief engineer, Louisville & Nashville, Louisville, Ky.

Buildings—J. B. Schaub (chairman), assistant engineer buildings, Illinois Central, Chicago; O. W. Stephens (vice-chairman), assistant to chief engineer—maintenance, Delaware & Hudson, Albany, N. Y.

Wood Bridges and Trestles—C. H. Newlin (chairman), supervisor bridges and buildings, Southern, Bristol, Va.; W. C. Howe (vice-chairman), engineer bridges and buildings, Bessemer & Lake Erie, Greenville, Pa.

Masonry—W. R. Wilson (chairman), assistant engineer, bridge department, Atchison, Topeka & Santa Fe, Chicago; M. S. Norris (vice-chairman), senior engineer, Baltimore & Ohio, Pittsburgh, Pa.

Highways—W. H. Huffman* (chairman), assistant to chief engineer, Chicago & North Western, Chicago; Bernard Blum (vice-chairman), chief engineer (retired), Northern Pacific, St. Paul, Minn.

Records and Accounts—Louis Wolf* (chairman), assistant engineer, Missouri Pacific, St. Louis; H. N. Halper (vice-chairman), valuation engineer, Erie, Cleveland.

Water, Oil and Sanitation Services—G. E. Martin (chairman), superintendent water service, Illinois Central, Chicago; H. L. Mullen (vice-chairman), engineer water supply, Texas & Pacific, Dallas.

Yards and Terminals—J. E. Hoving* (chairman), as-

sistant to chief engineer, Northern Pacific, Pasco, Wash.; J. N. Todd (vice-chairman), superintendent scales and work equipment, Southern, Washington, D.C.

Iron and Steel Structures—J. L. Beckel* (chairman), engineer structures, New York Central, New York; J. F. Marsh (vice-chairman), engineer bridges, Chicago, Rock Island & Pacific, Chicago.

Economics of Railway Location and Operation—J. W. Barriger (chairman), vice-president, New York, New Haven & Hartford, New Haven, Conn.; H. B. Christianson, Jr. (vice-chairman), Atchison, Topeka & Santa Fe, Chicago.

Wood Preservation—W. F. Dunn, Sr. (chairman), tie and timber agent, Southern, Washington, D. C.; A. J. Loom (vice-chairman), general superintendent timber preservation, Northern Pacific, Brainerd, Minn.

Contract Forms—G. W. Patterson (chairman), assistant chief engineer, Central region, Pennsylvania, Pittsburgh, Pa.; W. D. Kirkpatrick (vice-chairman), assistant engineer, Missouri Pacific, St. Louis.

Economics of Railway Labor—R. J. Gammie (chairman), chief engineer, Texas & Pacific, Dallas; D. E. Rudisill (vice-chairman), chief engineer maintenance of way, Western region, Pennsylvania, Chicago.

Cooperative Relations with Universities—C. G. Grove (chairman), chief engineer, Western region, Pennsylvania, Chicago; R. J. Stone (vice-chairman), vice-president, St. Louis-San Francisco, St. Louis.

Waterways and Harbors—Arthur Anderson (chairman), special assistant engineer, New York Central, Chicago; A. L. Sams (vice-chairman), office engineer, Illinois Central, Chicago.

Maintenance-of-Way Work Equipment—R. K. Johnson* (chairman), superintendent work equipment and reclamation, Chesapeake & Ohio, Barboursville, W. Va.; C. E. Morgan (vice-chairman), superintendent work equipment and track welding, Chicago, Milwaukee, St. Paul & Pacific, Chicago.

Clearances—A. R. Harris* (chairman), engineer bridges, Chicago & North Western, Chicago; A. M. Weston (vice-chairman), senior assistant engineer, Baltimore & Ohio, Baltimore.

Waterproofing—T. M. von Sprecken (chairman), assistant to chief engineer, Southern, Washington, D.C.; L. J. Deno (vice-chairman), division engineer, Chicago & North Western, Escanaba, Mich.

Impact and Bridge Stresses—J. P. Walton* (chairman), engineer bridges and buildings, Western region, Pennsylvania, Chicago; E. S. Birkenwald (vice-chairman), engineer bridges, Southern, Cincinnati, Ohio.

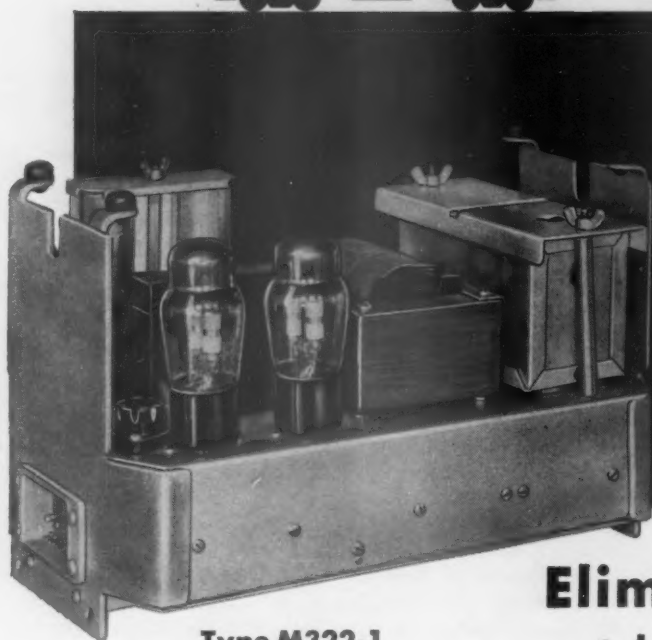
Special Committee on Continuous Welded Rail—H. B. Christianson (chairman), assistant chief engineer, Chicago, Milwaukee, St. Paul & Pacific, Chicago; L. F. Racine (vice-chairman), chief engineer, Chicago, Indianapolis & Louisville, Lafayette, Ind.

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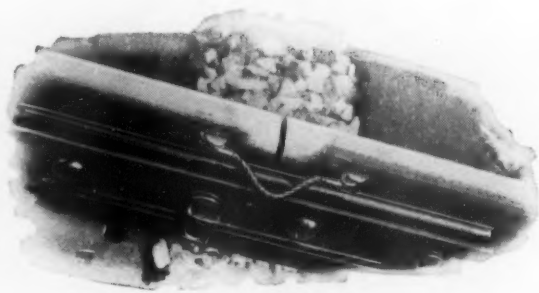


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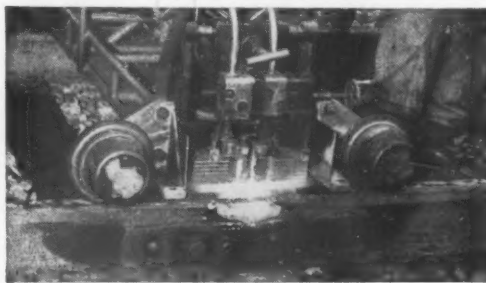
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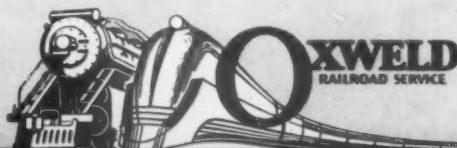


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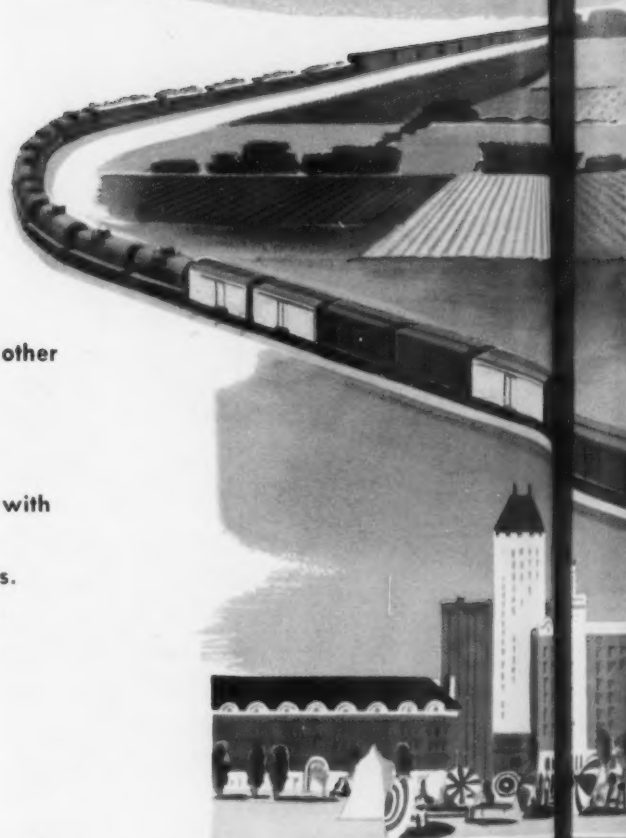
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Reports and addresses were presented in rapid succession during the business sessions.

HIGHLIGHT REPORT OF

A.R.E.A. Technical Sessions

A running account of the important and significant subjects dealt with in committee reports and addresses presented at last week's meeting

Since last July the work being done by the A.R.E.A. standing committees has been gradually unfolded to the members of that association through its publications, beginning with Bulletin No. 502, issued in July 1952, and ending with Bulletin No. 507, issued in February 1953. These bulletins contain not only the reports of the association's 23 technical committees (including its one special committee) but also reports on many of the research projects being sponsored by the A.R.E.A.

Because the committees were charged by the Board of Direction to complete their reviews of all Manual material in the chapters for which they were responsible, the major efforts of the committees were directed to that end. However, a large number of the reports presented dealt with subjects other than the revision of the Manual, and a number of supplementary addresses were made, so that many topics were brought up at the convention to capture the interest of engineers in the maintenance-of-way and structures field.

For the trackman there were the reports of the Committees on Roadway and Ballast, Ties, Track, Rail, Continuous Welded Rail, Maintenance-of-Way, Work Equipment, and Economics of Railway Labor.

Maintenance Methods & Economics

According to the Roadway and Ballast report, a nine-year record of 15 projects of soft-track and water-pocket stabilization through pressure grouting clearly shows that the grouting resulted in a reduction in maintenance that greatly exceeded the original cost of stabilization. Cost and man-hour figures reported by 15 other railroads for more recent projects of this kind verified this conclusion and showed savings ranging from 31 to 100 per cent a year.

This report also included a fifth progress report on the measurement and study of soil pressures under normal rail traffic. Some of the conclusions drawn from these tests are: Recorded vertical pressures are in fairly close agreement with theoretical vertical pressures, but considerable divergence exists between theoretical maximum shear values and the recorded maximum shear values; that it would appear the elastic theory does not give sufficient accuracy for predicting lateral pressure intensities and shearing stresses in earth masses; that steam locomotives produce higher pressure intensities than diesel locomotives; and that grout stabilization de-



From the Chesapeake & Ohio (Pere Marquette district)—F. B. Manning, engineer bridges and structures; E. J. Hartsell, office engineer.



From the Frisco—I. C. Brown, water engineer; L. M. Harsha, special engineer; E. L. Anderson, chief engineer.

creases the subgrade pressure intensities somewhat, although this effect seems to be most pronounced immediately after treatment.

For those who are considering driving ties or poles along the roadbed as a means of stabilization, a preview of recommended practice can be found in the Roadway and Ballast report, as this information was submitted on a tentative basis with the idea that it will be submitted next year for adoption in the Manual.

Ballast has come in for intensive study and research for determining the durability and stability of various types and gradations of material to obtain information which will help reduce ballast costs by the rational selection of available types and gradations to produce the best service records and lowest maintenance expenditures. A number of ballast material samples were sent to a laboratory for correlating these tests with field performance but the number of samples submitted was small so the tests offered little by way of definite information which might be used in establishing realistic specification limits.

For proper functioning, ballast must be kept clean. One of the ways to maintain it in a clean condition is by keeping it free of plant growth. Since chemical control is so widely used, and a large assortment of chemicals is available, a series of investigations of various combinations of chemicals are being made at Iowa State College, Ames, Iowa, under a cooperative agreement between the Iowa Agricultural Experiment Station and the Engineering Division of the Association of American Railroads to determine the more favorable combinations of herbicides and to check on the residual effect of the treatments.

W. E. Loomis, professor of plant physiology at Iowa State, is in charge of the work. He reported that several hundred additional treatments were applied this season along with a follow-up of last season's work.

Field investigations are also being conducted with various herbicides by the research staff of the A.A.R. and they were the subject of a report by J. A. Fellman, assistant research engineer roadway. Mr. Fellman said the most successful weed-control programs are usually started in the spring, from February in the South to early May in the North. Good results have also been ob-

tained with late fall treatments when the subsequent spring thaw was gradual and the runoff not too severe. Best results on perennial vegetation with soil sterilants, such as chlorate or TCA (sodium trichloroacetate), have been obtained on some sections when applied just as plant growth is emerging or a little before. Where annual weeds have been a problem and a contact spray, such as oil, is used, best results have occurred when plants were allowed to come up but were sprayed before they set seed. The spray should be repeated when a new crop appears.

It has been apparent from these observations, Mr. Fellman said, that one light spray in the spring cannot be expected to control vegetation all summer. In the North one application may last all season, while in the South two or three may be required. Also, after the control of the perennial vegetation is obtained, annuals may appear later in the season. Weather seems to have a great deal of effect on results. "No one chemical has been found that will give good results for all types of vegetation," he said.

Control of vegetation on the right-of-way other than in the track area was investigated by the Committee on Economics of Railway Labor. This committee found that hand mowing is seldom done today, as the average cost is about \$58 per acre. Machine mowing, which has increased considerably, costs about \$13 per acre. Chemical control, the committee said, costs about \$23 per acre, except that the cost of removing dead trees and brush is not included. Chemicals under bridges cost less than one cent a square foot. The committee concluded that smoothing the right-of-way to permit the use of tractor mowers is justified, that chemical control of brush and vegetation is economical, and that chemicals applied under bridges reduce the amount of labor in keeping these areas free of vegetation.

Crosstie Durability

While most track men know the various reasons why ties are removed from the tracks, they are not always aware of the order of sequence of the causes leading to removal. If this were better known, it might point to ways for overcoming the vulnerable characteristics of



G. B. Campbell, tie and timber agent, Missouri Pacific; A. B. Chaney, assistant chief engineer, system-maintenance, MP; J. M. Giles, special representative, Caterpillar Tractor; W. F. Dunn, Sr., tie and timber agent, Southern.

the ties, resulting in longer service life. To develop this information, the Ties Committee sent out a questionnaire to 46 chief engineers, but only 5 roads responded. Based on a total of 6 million crossties, the causes of removal were: Decay, 58 per cent; plate cutting, 17 per cent; splitting, 16 per cent; and (in the order of decreasing percentages) derailments and dragging equip-



W. B. Blix, manager, railway equipment division, Nordberg Manufacturing Co.; C. I. Hartsell, division engineer, and T. F. Burris, chief engineer, both PM district, C&O; F. N. Beighley, roadway engineer, Frisco.

ment, crushing or shattering, broken, spike killed, natural defects, and miscellaneous causes.

Some roads are using a tie coating for protecting ties from the elements and prolonging their service life. A canvas of railroads showed that two such materials predominated as coatings, these being Koppers' Compound 16 and Protek-Coat, but that all installations were

A.R.E.A. Manual Being Reprinted

This year will see the completion of the monumental task of bringing up to date, and re-editing, rearranging, and otherwise modernizing, the Manual of Recommended Practice of the A.R.E.A. This undertaking came to a climax at last week's convention when the standing committees of the association made recommendations for bringing up to date the material in their respective chapters.

It has been customary over the years for these committees to add new material to their chapters in the Manual and to make revisions in the existing material, but for the past two years they have been reviewing the text in a particularly thorough and critical manner to the end that the new printing will represent the very latest practices and specifications. A hint of the magnitude of the work performed by the committees is given by the fact that recommendations pertaining to approximately 500 Manual documents were made and passed upon at last week's convention.

The Manual of the A.R.E.A. contains all of the current specifications, plans, designs, forms, definitions and basic principles that have been adopted as recommended practice for railway construction and maintenance by the association. For many years the Manual was issued periodically in bound book form, but in 1936 it was first brought out in its present loose-leaf form, containing 886 sheets, or 1,772 pages. Subsequent to that date, 2,154 sheets have been added and 1,960 withdrawn, so that the present Manual now contains 1,080 sheets, or 2,160 pages. Since 1945 the Manual has been issued in two volumes.

There are a number of reasons behind the project to reprint the Manual, apart from the desire to bring the material up to date in every respect. Basically, these stem from a desire to rearrange the contents as necessary to bring all related material together, and to rectify a weak-

ness of the Manual by incorporating a number of features designed to assure the user that his copy is complete and contains the latest sheets of each document. In connection with the reprinting, all pages of the Manual are being re-edited to a uniform standard, and a new paging system has been adopted to permit future addition of material in proper sequence with the minimum use of decimal page numbers.

Each chapter will now have a detailed table of contents, which will bear the latest document dates and which will be reissued each year, and each document will have a document date in bold-face type directly under its heading. Furthermore, a new footnote at the bottom of the first page of each document will show the latest approved page consist of the document, by page and date, so that the user can be assured at all times that he has the latest pages of any document regardless of the different dates the pages may bear.

The new Manual will be issued in the same basic form as the present manual—i.e. loose-leaf with two binders. Every effort will be made to have the new book available for distribution in December of this year. It will consist of about 2,300 pages which will be shipped to member holders of the Manual in the form of a filler for their present binders. Since the old fillers will be completely out of date they will necessarily have to be discarded.

While the work of the committees, insofar as the immediate reprinting of the Manual is concerned, is done, the work of the secretary and his staff is far from being completed. All the extensive changes voted at last week's meeting must be incorporated in the text, the work of reorganizing the material in each chapter remains to be completed, and the printer's proofs must be read and checked before the presses can roll.



R. L. Groover, chief engineer, Atlantic Coast Line; C. E. McCarty, manager, Potomac yard, RF&P; G. H. Riddle, sales engineer, Bethlehem Steel Company; J. C. DeJarnette, Jr., chief engineer, RF&P.



R. R. Crosby, bridge engineer, Kansas City Southern; G. L. Staley, bridge engineer, Missouri-Kansas-Texas.

too recent to evaluate results. This subject is being continued.

In an address following the report of the Wood Preservation Committee, W. Buehler, consulting technologist of the School of Forestry of the College of Agriculture, University of Florida, discussed "Controversial Issues of Crosstie Preservation." Such issues, he said, may be divided into two general classes: Those dealing with methods of treatment, preservatives, seasoning, adzing, boring, incising, etc.; and those dealing with what can be called mechanical protection, such as tie pads, tie coatings, tie plates, anti-splitting devices, etc.

As a specific controversial subject, Mr. Buehler pointed to the use of various mechanical devices which are advocated to increase tie life, and he cited an illustration where the cost of four crossties lasting 30 years was compared with that of three ties lasting 40 years where the increased life was obtained by the use of special spikes and hold-down dowels, tie pads, tie coatings, and anti-splitting devices.

From an examination of the issues reported by railroads in response to a questionnaire, Mr. Buehler said there are really no serious controversies. Many matters that appear controversial are "really only differences of opinion resulting from experience under different climatic environments." It is Mr. Buehler's opinion "that standard specifications for preservatives and the Manual of good practice cannot be specific within narrow limits, but rather should be broad enough within safe limits so that an individual operator can write his specification to fit his particular condition and yet be within the framework of safe practice."

From its study of the efficiency and economy of hold-down fastenings and tie pads for prolonging the service life of ties by minimizing plate cutting, the Track Committee, reporting on its test installation on the Louisville & Nashville, told in detail of the measurements taken at each test location and the changes that were made and have taken place, covering pads and their coatings, hold-down fastenings, tie coatings, and the moisture content of the wood in the tie-plate areas. This committee stated that, although several of the special fastenings and types of pads have been effective for periods of as much as five years, conclusions must take into account the eco-

nomie aspects and will require several more years of testing.

From measurements taken by the Track Committee in its investigation of tie-plate loads, the committee reported that swinging ties resulted in an average increase of tie-plate loads of 4,000 lb. under steam locomotives and of approximately 5,000 lb. for diesel locomotives. However, the individual tie-plate loads measured under the diesel locomotives were more uniform, and the steam locomotives produced higher individual tie-plate loads than the diesels.

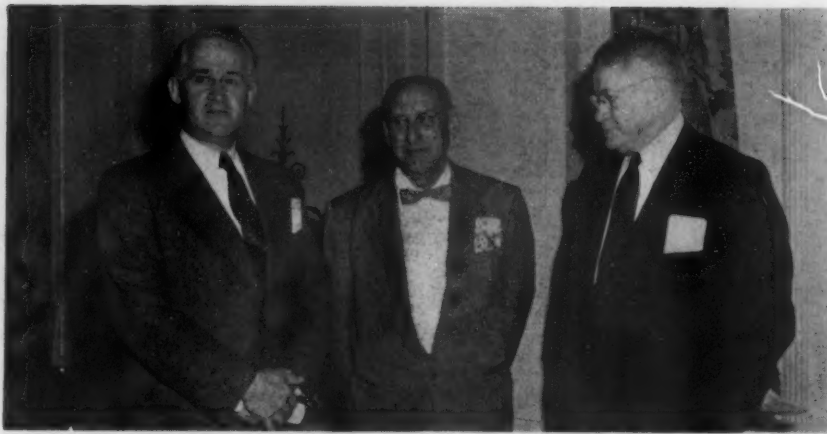
This committee also reported on the service tests of seven designs of tie plates. The rate of plate cutting for the past two years on the test plates was reported to be 50 per cent greater than for the previous three-year period.

On a 4-deg. curve the 13-in. length plates, compared with the 11-in. design, effected a greater reduction in plate cutting than would be expected from the inverse ratio of plate lengths. Excluding one plate with the pressed circular rail seat and bottom, the committee stated that the shape of the rail seat of the other 11-in. designs had no important influence on the amount of plate cutting. Assuming that tie plates should have a service life of not less than 20 years, the committee concluded that it will require several more years to develop the effects of corrosion on the resistance to bending.

Rail Gets Much Attention

Whenever track men get together, rail always gets their concentrated attention. It was the same this year when the Committees on Rail and on Continuous Welded Rail presented their reports and when addresses were given by R. E. Cramer, special research associate professor of the University of Illinois, and by Ray McBrian, engineer of standards and research, D&RGW.

Mr. McBrian discussed his road's rail problems in the Moffat tunnel, the principal one being corrosion. Since diesel locomotives came into use, he said, the rate of corrosion has dropped radically. In 1938, his road tried 112-lb. welded rail to reduce joint corrosion troubles, but then stress-corrosion cracks in the web at the bolt holes, used for weld-clamping purposes, occurred.



V. C. Otley, manager, Barrett division, Allied Chemical & Dye Corp.; Walter Buehler, consulting technologist, School of Forestry, University of Florida; W. J. Burton, assistant chief engineer (retired), historian, Missouri Pacific.



From the MP—J. H. Brossette, assistant division engineer; Jack Largent, supervisor work equipment.

The 112-lb. welded rail, after five years of service, was replaced with 130-lb. welded rail to obtain more head wear, then in 1950 with 133-lb. pressure-welded rail. Rubber pads were applied between this rail and the tie plates and galvanized fastenings were also employed to reduce corrosion.

The Rail committee's statistical report on rail failures stated that about the same mileage of control-cooled rail was laid in 1950 as in 1949 and 1948 and that there continue to be practically no transverse-fissure failures developing in control-cooled rail. It appears, the report continued, that the amount of detector-car testing will be an important factor in obtaining a further reduction in transverse-fissure service failures.

The quality of steel and the excellence of rolling mill practice has resulted in the 1946 rolling having the same low failure rate as the 1945 rollings. It is evident that compound fissures and detail fractures, and web failures within the joint bar limits, are the most prevalent types of failures occurring in control-cooled rail. The report stated it can be expected that the new rail designs and bolt-hole spacing, as well as the research work under way on corrosion prevention and bolt-hole finishing, will reduce incidence of failures within joint-bar limits.

In a report and an address, supplemented by slides, on the causes of rail failures and defects, Professor Cramer said that a total of 43 failed control-cooled rails were sent to the University of Illinois for examination since last year's report on the same subject. Of this number, 2 failed from transverse fissures from shatter cracks, 13 from transverse fissures due to hot torn steel, 2 from transverse fissures due to inclusions, 4 from fractures at welded engine burns, 15 from detail fractures due to shelling, and 12 from other causes. He also reported that the number of rails which break from welded driver burns appears to be small when compared with the number of engine-burn fractures which develop from engine burns that are not welded.

It is thought, continued Professor Cramer, that stress concentrations at the sharp corners of a bolt hole—often aided by corrosion pitting both from inside the hole and from the side of the web—start most bolt-hole fractures. Indications are, he said, that these failures might be prevented by chamfering the edges of the bolt holes.

He reported one unusual rail defect found by a detector car, which was a lap or seam containing mill scale extending to a depth of $\frac{1}{4}$ in. below the rail tread but which was sealed almost completely at the surface of the rail. He also reported that shrinkage cracks in the beads formed when building up rail batter can be avoided by proper preheating of the rails previous to arc-welding.

The Rail committee continued its study on the economic value of rail sizes and presented a progress report on the 112-lb. and 131-lb. rail installations on the Illinois Central. A total of the maintenance charges to date showed a saving of \$452 per mile per year in favor of the heavier section, which represents a saving of 15.2 per cent when compared with the lighter section.

Shelling Is Still a Headache

The Rail committee also reported that research work to date has failed to reveal any positive solution for the causes of shelly spots and head checks or effective methods of prevention. Gage-corner contour design improvements made of the 115-, 132- and 133-lb. RE sections have assisted in retarding the onset of shelling but have not prevented its eventual occurrence. Where the expense may be economically justified, heat-treated and chrome-vanadium alloy rail is effective in extending the time after which gage-corner shelling will occur.

Another common failure of rail is the bolt-hole crack, and the Rail committee is pursuing its investigation of this subject with the idea that a change in rail design might prevent this type of failure. It reported that, from stress measurements made with strain gages around bolt holes of a rail with the joint in tension, tensile stresses are developed around most of the circumference of the bolt hole when the bolt comes to a solid bearing as a result of rail contraction in cold weather; that these stresses are a maximum directly at the point of bolt bearing and may exceed the yield point; that they diminish rapidly each way from this point and become zero or even compressive directly opposite; and that, although of moderate intensity at 45 deg. from the horizontal, they may be a factor in the development of bolt-hole cracks which normally occur at this location.

As to developments that affect rail design, the Rail



F. H. Taylor, assistant engineer maintenance of way, FEC; J. H. Morgan, engineer maintenance of way, FEC; J. M. Salmon, Jr., chief engineer, Clinchfield.

committee said that stress measurements will be made in the fillet areas of the present design of 100-lb. RE rail and joint bars; that a study of rail web bolt-hole finish is being carried out at the Central Research Laboratory in regard to fatigue failure, and that a survey of the proposal for the adoption of the 140-lb. PS rail section as an A.R.E.A. standard is now in progress.

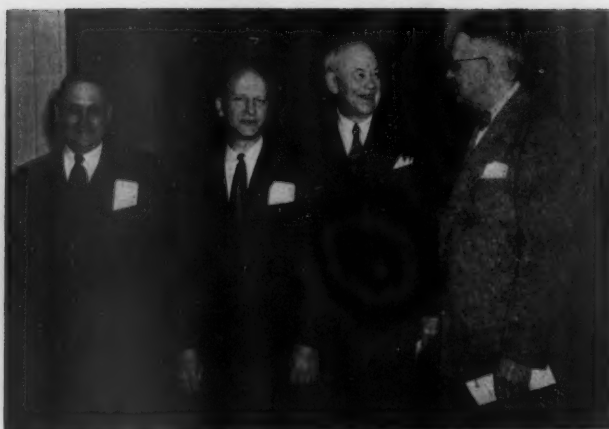
What About Long Rails?

Since several railroads have laid sections of track with 78-ft. rails, the Rail committee, in collaboration with the Track committee, has set up test sections of rails of this length to study the performance and economics of longer rails. A test section of 115-lb. rail was established on the eastbound main track of the Chicago & North Western near Calamus, Iowa, and one for the 133-lb. RE rail was established on the eastbound main track of the Pennsylvania between Hamlet, Ind., and Hanna. Initial measurements were made of rail-surface profile, joint camber, and out-to-out distances on bars for determining the rate of rail-end batters, joint droop, and fishing surface wear. Similar measurements were taken on adjoining 39-ft. rail sections to serve as a comparison for the 78-ft. rail.

What about the still longer rails—the continuous welded rail? Those maintenance engineers who have been hesitating to recommend to their managements the laying of continuous welded rail may be influenced by the fact that the special committee assigned to study the subject has presented a favorable report for the use of welded rail.

The report states that the quality of the gas-pressure weld has steadily improved as to production of a weld that has good alignment, both vertically and laterally. The rail-laying organization and equipment used to install welded rail are essentially the same as for jointed rail with standard rail-laying gangs. Where tie-in or field welds are used, they are made as soon as possible after the rail is laid. The welded-rail lengths considered by the various using roads to be the most economical vary from 500 to 1,600 ft.

The committee recommended that, wherever practicable, continuous welded rail be laid in the summer season and anchored at temperatures ranging between



R. J. Gammie, chief engineer, T&P; H. E. Kirby, cost engineer, C&O; E. C. Vandenberg, chief engineer (retired), C&NW; L. T. Nuckols, chief engineer, C&O.

70 and 90 deg. F. Six rail lengths (234 ft.) should be fully box-anchored at the ends of the welded-rail sections and on the connecting conventional bolted track. While the committee pointed out that the amount of intermediate anchorage depends on rail creepage due to traffic and other conditions, it recommended that anchors be placed on alternate ties in the direction of traffic for average one-way traffic, with every fourth tie box-anchored for back-up movements, and, for average two-way traffic, that alternate ties be box-anchored throughout the length of the welded rail section. Six-hole joint bars were recommended at the ends of the continuous rail sections.

Welded Rail Can Produce Savings

Reporting on the maintenance of welded rail, the special committee said that out-of-face surfacing, reballasting, general tie renewals, etc., may be carried out provided that temperatures are the same, or lower, than the temperature at which the continuous rail was initially laid. The ballast section must be maintained to full standard section. Spot tie renewals may be made, except that disturbance of the ballast for long stretches at temperatures above that at which the continuous rail was laid, and pulling of spikes on several adjacent ties, must be avoided. The replacement of broken or defective segments of continuous welded rail may be handled by cutting in a length of rail. Permanent cuts should be made by a rail saw. Rails shorter than 39 ft. should be installed adjacent to insulated joints to permit proper maintenance. Experience with welded rail in open track today, the committee reported, indicates that maintenance savings of approximately 25 per cent may be possible in comparison with jointed track under the same conditions.

A study of the economics of welded rail in comparison with jointed track, taking into consideration first cost, maintenance cost, life and salvage value of each type of rail, was made by the committee based on replies to a questionnaire submitted to railroads having experience with welded rail. Due to the fact that very little of the welded rail has worn out in service, and that much of the rail in the heavier weights with which it is compared is also still in service, the data were largely estimated.



F. W. Holstein, assistant to president, Rails Company; L. T. Burwell, president, Rails Company; F. G. Campbell, chief engineer, Elgin, Joliet & Eastern.

The cost of installing continuous welded rail is greater than for conventional bolted rail; this additional cost is said to be the equivalent of \$24 per mile per year for 131-lb. rail or heavier. However, the savings accruing from annual maintenance and the capitalization of this maintenance saving produce an annual average saving of \$375 per mile, according to the committee. Because of the extended service life expected of welded rail over jointed rail, an additional annual saving of \$145 per mile is expected. The out-of-face surfacing cycle is also extended, which results in a further estimated annual saving of \$175 per mile. Deducting the annual additional cost to relay welded track, an annual saving of \$671 per mile is expected by laying welded rail instead of jointed rail for the 131-lb. and heavier sections. Using the same method of comparison for 112-lb. and 115-lb. welded rail, a total annual saving of \$630 per mile is effected over jointed track.

The committee points out, however, that, since welded track should be worked only when the temperature is at or near the installation temperature, it would be a problem to obtain efficiency from the maintenance forces if any division were predominantly of welded construction. On the other hand, the difference between the initial cost of welded and jointed track will be reduced with wider use, the committee believes, and more efficient methods of handling will be developed.

Manpower Economics

Innumerable times track men have had questions about how other railroads maintain their tracks and what forces are used for this purpose. Data have been accumulated by the Economics of Railway Labor Committee, which circularized the railroads and has presented the resulting information from 55 Class I roads in tabular form. This table shows the maximum speeds allowed for passenger and freight trains; the weight of rail and type of ballast; whether the section gangs are supplemented by small or large extra gangs; by whom and how often track inspections are made; whether or not heavy maintenance, such as rail relaying, surfacing, tie renewals and other operations, are handled by special gangs; the average number of track laborers employed in winter and summer in both section and extra gangs; the type of transportation



R. J. Pierce, division engineer, Erie; A. B. Fowler, superintendent of construction, Erie; J. C. Simmons, vice-president, Rust-Oleum.

afforded these men; and the extent to which the forces are furnished with labor-saving equipment.

To make it easier for one road to compare its forces and operations with roads of similar characteristics, the table separates this information according to traffic, speed, the number of tracks, and whether the tracks are subject to frost action or are frost-free. A tabulation was also presented showing the organization for terminal yard maintenance.

The report of the Committee on Economics of Railway Labor also dealt with a study of the economic effect of slow orders on maintenance operations. It stated that "in view of present speeds of both passenger and freight trains, and based on replies from many chief maintenance officers, it is not considered practicable to perform many heavy maintenance operations unless the maintenance forces have the benefit of a slow order, not only from the standpoint of the present high unit cost of labor, but also from the standpoint of safety to train operations and to maintenance forces. These factors," it continued, "make it highly desirable that such work be carried out with slow order protection."

H. E. Kirby, cost engineer, Chesapeake & Ohio, Richmond, Va., followed the presentation of the report of this committee with a paper on the subject, "Reducing Man-Hours." He compared the expenditure of 471.5 million man-hours by Class I railroads during 1951 in maintaining their tracks and roadway with the 552 million man-hours spent for the same purpose in 1931. Trafficwise, he said, 80 per cent more use was made of the properties in 1951 than in 1931.

Mr. Kirby did not attempt to evaluate the several forces involved in producing a lower expenditure of man-hours for maintaining properties that were used so much more, but he did attribute the gain in part to better tools, materials, equipment and thinking. A trend toward mechanization, he said, "will of necessity continue since it is one of the few courses that hold any promise of future economies." He also pointed out that, while a saving (again as compared with 1931) was made in 1951 of the man-hours of work for maintaining the tracks and roadways, it cost \$460 million more to do so.

There is not much that can be done, according to the report of the Highway committee, for developing a satisfactory formula for universal use in determining relative



R. M. Jenner, vice-president, Railway Maintenance Corporation; J. S. Parsons, assistant chief engineer, maintenance of way, of the Erie.



From the Pennsylvania—M. L. Koehler, assistant engineer bridges and buildings; J. W. Wallenius, assistant chief engineer, Eastern region; J. W. N. Mays, supervisor of structures.

hazards at highway-railroad grade crossings or in establishing priorities for improved grade-crossing protection. The report did recognize certain factors that should enter into the evaluation of this hazard and listed them with the qualification that "surprise" elements, such as driver visibility conditions, vehicular conditions and driver behavior, and mental and physical conditions, are also factors to be considered and weighed in the establishment of a hazard index.

This committee also presented a comprehensive report on the economics of highway-railroad grade separations in which it was pointed out that formulas now available to determine the order of importance in programming grade-separation projects are based primarily on obtaining the greatest benefits to the largest number of highway users. The use of these methods gives no consideration to the physical or economic effects on the railroad.

Buildings and Bridges

The Building committee described a simplified design of small air-conditioning installations using package air conditioners. While acknowledging that the services of a specialist in this field of engineering are essential for the larger installations, the report stated that the majority of railroad installations of air conditioning are in railroad office buildings, containing less than 45,000 cu. ft., and that these can be designed intelligently on a simplified basis by railroad building engineers and architects. The report then dealt with the mechanical "package air-conditioning unit," which consists of a compressor, a condenser, an expansion valve, an evaporator, and a blower—all built into one cabinet and designed for coordinated operation. It also dealt with the design factors entering into such installations and the variables that will affect overall results.

A report on preventing concrete deterioration, submitted by the Waterproofing committee, was of especial interest to the bridge and building men. From results of tests of 85 commercial and some experimental products over several years at Purdue University, the committee reached several conclusions. Among these are that the impermeable type of coating

- Can be applied satisfactorily to concrete surfaces

that are exposed to severe outdoor weathering so long as all the surfaces that are subject to moisture absorption can be coated.

- Is superior to the permeable type of coating in preventing the passage of moisture in either the vapor or the liquid form in the total immersion tests or in the outdoor absorption tests.

- Is superior to the permeable type of coating from the standpoint of durability of the coating, as well as durability of the concrete when the coated concrete is subjected to freezing and thawing.

- Is more durable, according to the results of tests in which coatings were applied to the south-facing wing walls of an overpass structure.

On the basis of its investigation, the committee submitted specifications for waterproofing coatings for exposed concrete surfaces.

Following this report, J. B. Blackburn, research engineer at Purdue University, under whose direction the tests were conducted, emphasized to the members that they must realize the limitations of the conclusions reached from that report. "If moisture is entering a structure from some unprotected surface which cannot be waterproofed," he said, "such as the fill side of a retaining wall or abutment, the application of such a coating on the exposed surfaces will result in blistering and loosening of the coating from the surface and actually speed up the rate of deterioration to the underlying concrete.

"Our data and recommendations," he said, "are applicable to slowing or preventing deterioration on hand rails, banisters, curtain walls, piers and columns above grade, and the exposed surfaces of retaining walls and abutments if it is certain that the surface against which fill was placed was adequately waterproofed at the time of construction."

A final report was submitted by the Iron and Steel Structures committee on the effect of grip on the fatigue strength of riveted and bolted joints. It said that cold-driven rivets may have as great a fatigue strength as hot-driven rivets for grips not over 1 3/16 in. long, but that for longer grips the fatigue strength of cold-driven rivets diminishes whereas that of hot-driven rivets increases. Under these circumstances the committee did not recom-



E. T. Cross, vice-president, Armeo Drainage & Metal Products, Inc.; K. L. Miner, engineer of bridges, New York Central; J. R. Hursh, railroad sales manager, Armeo; J. L. Beckel, engineer of structures, NYC.

mend the adoption of specifications for cold-riveted construction or for revising existing specifications for steel railway bridges to permit use of cold-driven rivets.

Because bridge designers have not been certain as to how much of the braking and traction forces of trains are taken by the running rails and by the piles in trestles, an investigation to determine the bending stresses in piles is being carried out by the A.A.R. research staff. While final conclusions must await further tests, it was reported that studies to date indicate: Only longitudinal forces are transmitted to a structure when the brakes are applied to a fast-moving train; maximum longitudinal effects on the structure are produced when the train is stopped on the span by the application of the brakes; and the total longitudinal force produced when a train is stopped on a span exceeds A.R.E.A. specifications, the greater part being carried by the running rails.

Diesel Servicing Facilities

Several reports were presented on facilities for servicing diesel locomotives, and included discussions on fuel oil, water, and washing. One report on the fundamentals of diesel fueling facilities, presented by the Committee on Water, Oil and Sanitation Services, supplemented a report at last year's convention, and dealt with oil waxing, and the insulation and heating of tanks and related pipe lines with steam, hot water, and electricity. Electric strip heaters were not recommended. The heating of very large tanks for primary storage was said to be uneconomical; in such cases it is essential that the heating requirements be limited to a tank outlet heater. The prevention of freezing of separated water in tanks and pipe lines was also discussed.

Fires around fueling facilities were said by the same committee to be caused by carelessness, either in design, in operation, or in maintenance. The vapors coming from the fuel oil are responsible, it said, for all fires and, therefore, it is desirable to avoid practices which allow vapors to exist or collect. This report also dealt with the proper use of valves, couplings and pipe line traps, as well as with permanent and portable fire-fighting facilities and the painting and corrosion protection of steel tanks.



H. J. Kay, assistant division engineer, Canadian National; W. K. Hooper, assistant general manager, Sperry Rail Service; H. J. Fast, engineer maintenance of way, Canadian National.

Another report by this committee dealt with water facilities. While chemical treatment of diesel cooling waters, it said, generally is added manually while refilling the system, a treated cooling water storage system is the most desirable. Steam generator water may be taken from a treated water supply system and, when locomotives are equipped with water-treating facilities, from city water or raw water supply lines.

The corrosion of car-washing equipment came up for discussion, and it was reported that various coatings and linings can be used until acid-resistant alloy metals are available at economical prices. The committee report noted that several proprietary lined pipes are available to overcome the corrosion of pipe lines, and that the exteriors of pipes must also be protected under certain conditions. Acid-resistant materials were recommended for nozzle construction. Brushes, it said, are replaced more for mechanical wear than for corrosion.

For combating the deterioration of concrete in washing platforms, the report stated that indications point to coatings of asphalt or mastic compounds as a means of minimizing such damage, and that other helpful means include concrete hardeners, air-entraining agents, and perhaps acid-proof quarry tile on a base of acid-resisting asphalt mastic.

More Work Equipment Available

Track, bridge, building, and water-service men can take cheer from the report of the Maintenance-of-Way Work Equipment committee because of the 44 new machines it mentions as having been marketed last year. To assist manufacturers to produce machines that will more nearly fulfill railroad requirements, the report also suggested ways to improve machines already in use.

Equipment will not last very long unless it is kept properly lubricated. A report by this same committee on the general principles relating to the lubrication of equipment points the way to proper oiling. A lubrication chart showing the correct lubricants to be used with various machines, as well as a chart of equivalent lubricants of several of the larger oil refiners and producers, also accompanied this report.

For those interested in switch heaters, a report on



L. C. McDowell, maintenance of way representative, Air Reduction Sales Company; M. C. Taylor, supervisor of work equipment, Louisville & Nashville; R. J. Moe, sales manager, Woolery Machine Company; R. R. Manion, engineer maintenance of way, Great Northern.

the design, location and operation of various types of switch heaters, made by the Work Equipment committee, will be helpful.

Getting College Men Interested

For developing information as to the extent to which railroads have adopted programs for training technical graduates for supervisory and managerial positions, the Committee on Cooperative Relations with Universities sent out a questionnaire to 132 railroads and received 62 replies. Of those replying, 17 stated that they had training programs for graduates of technical schools, 8 others stated they have such programs under consideration, 20 said that they have no definite program in mind, and 17 said that such programs were impractical for them. Twenty-four have summer programs, 10 employ cooperative students, and 42 stated that they thought that a background of engineering education and subsequent experience was desirable.

The report of this committee stated that there are demands at present for approximately 40,000 graduates, as compared with an estimated 23,000 graduating in 1953. To make things worse the number of graduates receiving military commissions will more than double.

Following this report, O. W. Eshbach, dean of Northwestern Technological Institute, said in an address, "we are sacrificing many of the broad objectives of the Defense Act for the expediency of filling military quotas." While the long-term outlook on the supply of engineers is brighter, he said, due to higher freshman enrollment in engineering schools, little improvement can be expected in the supply of engineers until "military quotas are drastically reduced and the national budget balanced."

Following the report of the Contract Forms committee, which dealt entirely with revisions to the Manual, W. R. Swatosh, assistant to superintendent of construction of the Erie at Cleveland, gave an address on "Two Essentials of Engineering Science — Mathematics and Agreements." He traced the origin of mathematics to the present-day Arabic numerals and figures. He also reassured young engineers that they should have no apprehension in entering into agreements because these in-

struments are merely plans prepared with words and are as easily understood as conventional plans prepared for structures. The four essentials of an agreement, he said, are mutual consent to the terms of the agreement, competent parties thereto, a valid consideration (actual or presumed), and a definite and lawful subject matter to be acted upon.

As a guest speaker of the Committee on Economics of Railway Location and Operation, L. K. Silcox, vice-chairman of the board of New York Air Brake Company, gave an address on "Improved Transit Time of Freight Trains." He spoke of a survey made of some 1,850 shippers and receivers of freight as to what influenced them to ship by truck. The main reason cited was the shorter transit time of trucks. He predicted that future traffic will be handled by the railroads in larger-capacity cars, with many built for specialized service.

To reduce transit time, Mr. Silcox suggested that some agreement be reached between railroad management and the unions to reduce the number of terminal stops; that "non-stop" freight trains be operated between principal terminals, except for crew changes made on these runs, with some cars being held up if necessary until a sufficient number are on hand for making up a profitable train; and that car service be systematically policed by the roads to reduce delays in setting out loads and picking up empties from industry tracks. He ended his address on the note that "the best kind of systematic work and policing by on-line officers can improve the situation."

Tips on Freighthouse Design

From replies received by the Yards and Terminals committee from 52 railroads in response to a questionnaire on trends in freighthouse layouts, it seems that a modern freighthouse layout is a combined inbound and outbound facility of fire-resistant construction and with l.c.l. operations carried out on one floor. It has covered platforms of widths suitable for the operation of mechanized equipment and driveways with a hard-surface pavement. The tracks hold from 1 to 27 cars each, with 61 per cent having a capacity of from 15 to 27 cars.

Various types of mechanized freight-handling equipment, including conveyor systems, are in use. Many layouts have warm rooms and a cooper shop, and others have refrigerator rooms, valuables rooms, and rooms for unclaimed or damaged freight. The majority have toilets, wash and locker rooms and some have lunch rooms, shower rooms, rest rooms, drinking fountains and first-aid rooms. An increased use of communication systems, pneumatic-tube systems and mechanically operated cross-over bridges was noted.

Since conveyor systems have come in for a great deal of attention lately, even for use in old freighthouses, the Yards and Terminals committee presented a report on this subject. While "great strides have been made in the past 10 years," it said, "in converting l.c.l. freighthouses from hand to motorized operation, still further improvement in methods is desirable." It appears "that a long and narrow type of layout having relatively few platforms and tracks is the shape best adapted to conveyor operation," such conveyors being of the moving-chain type which tows four-wheel flat-bed trucks.

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Patented duolift rams with leakage return	Exclusive! Protects ram plunger from dirt, damage	—	—	—	✓
Highest lift speed of any electric truck	Does more work—faster	—	—	—	✓
Heavy section rolled manganese alloy steel uprights	Better wearing quality, proper flange strength	✓	—	—	✓
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Operations

(Continued from page 17)
cent of all construction in this country."

Mr. Mackie emphasized that money for improvements came from "railroad funds and earnings and not from public monies." "Indeed," he added, "the approximately \$53 million spent in 1951 by New England railroads for maintenance of roadway exceeded by \$14 million the amount of tax money spent for state highway maintenance in the six New England states in that year." The record expenditures for modernization, he said, were particularly noteworthy "when you remember that American railroads, with the exception of pipelines, are the only form of transportation completely self-supporting."

As an example of the "future" in railroading, Mr. Mackie referred to the so-called "piggy back" operation on the New Haven, whereby loaded highway trailers are carried on railway flat cars. "The experiment is of enormous potential importance," he stated, "and it is fitting, I think, that some of the most important laboratory work is being conducted right here in your New England."

In Congress

T.A.A. Transport Policy Report Goes to Congress

The Transportation Association of America last week submitted to Congress and the President a 260-page report based on four years research into the problems of transportation.

"Legislation to carry out sweeping revisions of law is being prepared for submission to Congress," Donald D. Conn, executive vice-president of T.A.A., said in announcing this latest step by the association.

Details of this initial T.A.A. study were first made public last year, when the original Cooperative Project report was filed with the T.A.A. board of directors (*Railway Age*, June 2, 1952, page 95). The board approved the report, with two exceptions, in January (*Railway Age*, January 26, page 11).

The two exceptions were statements on repeal of the Fourth Section (long-end-short-haul clause) of the Interstate Commerce Act, and on exemption of agricultural-product trucking from regulation. These items will get more study.

With this first report before Congress the association will now turn its attention to the federal structure of regulation and promotion—and what should be done about it. A report on this subject will be prepared and submitted to Congress, Mr. Conn said.

People in the News

Small to Head Railroads' Tariff Research Group

Robert O. Small, vice-president—rates and divisions, Chicago & North Western, has been elected chairman of the Administrative Committee which supervises the Railroads' Tariff Research Group. He will take over April 1 as successor to Fred Carpi, traffic vice-president of the Pennsylvania, who will also retire from membership on the committee.

The Traffic Executive Association—Eastern Railroads has appointed A. C. McIntyre, vice-president of the Lehigh Valley, to succeed Mr. Carpi as a member of the committee. Other new appointees to the committee are, Ephraim Rigg, vice-president, Chicago, Rock Island & Pacific, appointed by the Executive Committee—Western Traffic Association, to succeed H. L. Schaeffer, chief traffic officer, Missouri Pacific; and George B. Rice, traffic vice-president, Seaboard Air Line, appointed by the Executive Committee of the Southern Freight Association, to succeed Elmer R. Oliver, who retired December 31, 1952, as traffic vice-president of the Southern.

Mr. Rice is already serving on the committee. Terms of Messrs. McIntyre and Rigg, like that of Chairman-Elect Small, will begin April 1.

These changes have been made pursuant to the committee's plan for rotation of chief traffic officers in its memberships. One chief traffic officer from each of the three major territories

INDEX TO VOLUME 133

The index to the latest volume of *Railway Age*, July to December 1952, is now ready for distribution, and copies may be obtained by those subscribers desiring them. Requests should be addressed to the Circulation Department, *Railway Age*, 30 Church street, New York 7. Subscribers who have in previous years made application for the index need not apply again.

retires from the committee on March 31 of each year.

The committee and the Cooperating Committee of the National Industrial Traffic League will meet jointly at the St. Francis Hotel in San Francisco, Calif., on March 27 to consider tariff simplification proposals presented by the Research Group. Members of the committees will be guests at a luncheon to be held on that day under the sponsorship of the Transportation Club of San Francisco.

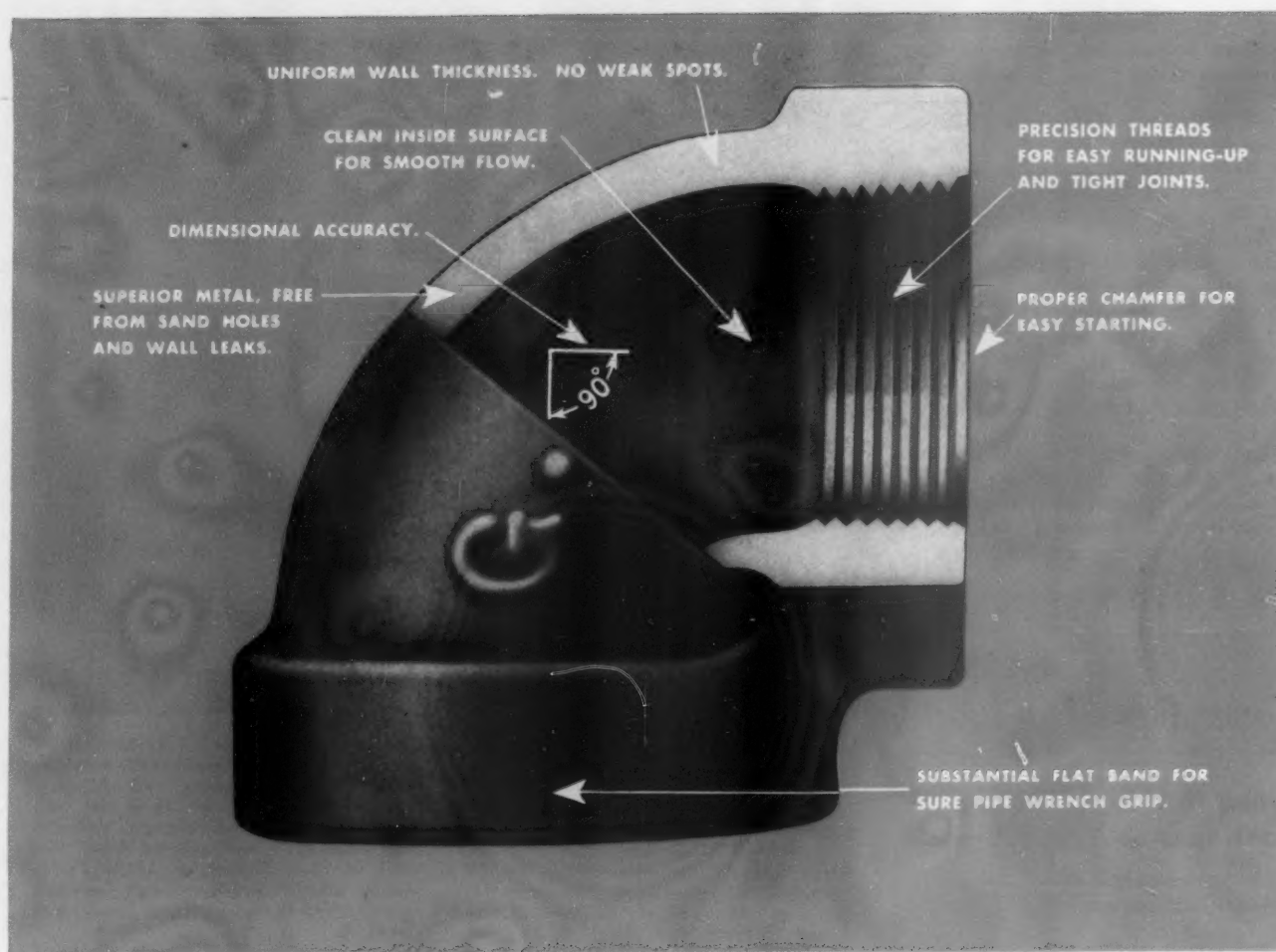
Safety

A.A.R Booklet Sets Out Fire Prevention Rules

A new booklet entitled "Rules Governing Fire Prevention and Fire Protection" has been compiled by the Fire



THE PENNSYLVANIA'S FOURTH AVENUE BRIDGE, which crosses the Monongahela river near downtown Pittsburgh, has walkways of electro-forged steel grating made by the Blaw-Knox Company.



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Protection & Insurance Section of the Association of American Railroads and is being distributed to chief operating officers of member roads of the A.A.R.

This booklet, the first of its kind, was issued after an extensive canvass of the railroad industry revealed a need for a set of rules dealing with fire hazards.

The booklet is divided into two sections, with the first portion including 170 fire prevention rules covering buildings, structures and incidental equipment; electrical, gas, gasoline and oil properties; miscellaneous heating equipment, and materials, installations and practices.

The second section of the booklet lists 44 fire protection rules covering use and maintenance of portable fire extinguishers, fire hose and fixed equipment, and describing general fire protection practices.

Competitive Transport

Trend to Heavier Trucks Continues on Rural Roads

The increased use of heavier trucks and combinations on the country's main rural roads is a continuing trend.

This was shown by 1951 figures compiled by the Bureau of Public Roads and included in the latest "Monthly Comment" issued by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission.

The figures indicated that 64 out of every 1,000 empty and loaded trucks and truck-trailer combinations using main rural roads in 1951 weighed 50,000 lb. or more. The comparable figures for 1950 and 1940 were 58 and 36, respectively. And the comparable figure for 1936-37 was three.

As to combinations of the truck-tractor and semi-trailer type, 187 out of 1,000 in the 1951 count weighed more than 50,000 lb., an increase of 47.2 per cent above the 1949 figure of 127. The comparable figure for 1950 was 165. "This type of combination," the I.C.C. bureau said, "handled 65.91 per cent of all highway ton-miles on main rural roads in 1949, 68.87 per cent in 1950, and 67.96 per cent in 1951."

Western Truckers Defeat Ton-Mile Levies

The Idaho legislature recently repealed a ton-mile tax on commercial vehicles. Writing its members on March 11, the Idaho Motor Transport Association said:

"Fifty-nine days of hard work and anxious waiting was followed by the passage of House Bill No. 295, one of the greatest victories for the organized



A NEW RAILROAD for transporting bauxite has been built by the Kaiser Engineers division of Henry J. Kaiser Company in connection with construction of mining facilities in Jamaica, B.W.I., for the Kaiser Aluminum & Chemical Corp. D. A. Rhoades, vice-president and general manager of Kaiser Aluminum, is shown driving the final spike, an

aluminum one. Don C. Tretzel, manager of Kaiser Aluminum's recently opened bauxite mining and shipping facilities on the island, is at the left. The 13-mile standard-gage railroad originates at inland mining areas and runs to Port Kaiser, at Little Pedro Point, where ore-handling facilities and a 995-ft. pier have been constructed.

trucking industry in many years . . . We certainly should pay tribute to the Idaho PAR Committee and the diligent work of our representatives on this important committee."

The Montana Motor Transport As-

sociation, in the March issue of its monthly bulletin, likewise exults over "the decisive defeat in the House of H.B. 250, which would have imposed a crippling ton-mile tax upon highway transportation."

Organizations

Traffic Club Memberships a Must!

N.I.T. League president stresses value of organization activity at Columbus meeting of Ohio Valley Board

"Affiliate yourselves with as many professional groups as it is possible to do in your field. By so doing, you will enlarge the scope of your understanding of your job."

That, in essence, is the message which Andrew H. Brown, transportation commissioner of the Cleveland Chamber of Commerce and president of the National Industrial Traffic League, brought to members of the Ohio Valley Transportation Advisory Board at its 105th regular meeting at Columbus, Ohio, March 11.

"If I were an employer," continued Mr. Brown, "I would doubt the in-

telligence and ability of my traffic man should he find himself too busy to join his fellows at his traffic club. On the other hand, as a member of such an organization, I would find some way of injecting more activities of the study and research type than are frequently found in the traffic clubs of the country."

C. R. Megee, vice-chairman of the Car Service Division of the Association of American Railroads, told members that the nationwide campaign to return cars to home roads has produced favorable results and that eight per cent more cars are now on home rails than

OSCILLOGRAMS REVEAL SECRET OF TWIN CUSHION ...

G

CONTROL

*
"G", the unit of change in velocity which is equal to the pull of gravity or 32.2 feet per second per second.

Superimposed above are exact copies of two oscillograms. The red line records impact of two friction draft gear equipped cars, (169,000 lbs. on the rail) at 7.53 mph. Black line shows impact of same cars Twin Cushion equipped, at 7.64 mph.

Note that peak coupler forces with Twin Cushions are 25% less. Note also that the rate of stress rise or "G" change is far less with Waughmat Twin Cushions, indicating a corresponding shock reduction.

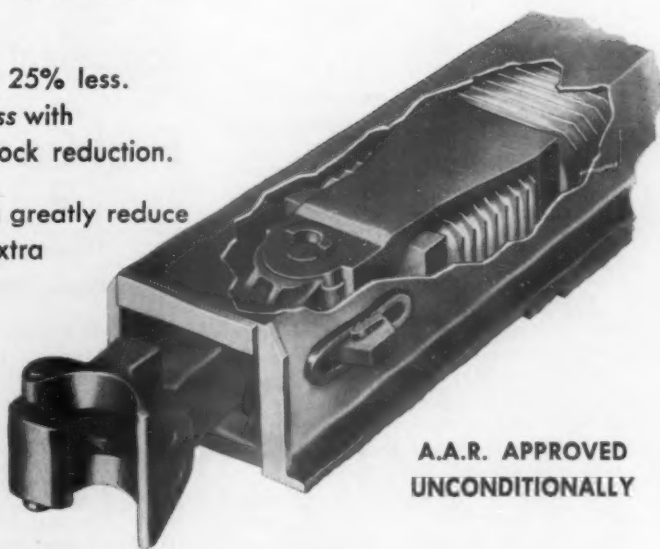
It's shock that damages lading and cars. Twin Cushions greatly reduce the degree of shock to both cars and lading. That's the extra protection provided when you specify Twin Cushions.

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ELECTRONICS ON RAILROADS —WHAT LIES AHEAD?

A forum on "Electronic Developments Which Await Railroad Developments"—believed to be the first arranged for by a single industry—is being planned by the Railway Systems & Procedures Association as a part of its next meeting, to be held in Chicago April 22-24. Edmund C. Berkeley, author of the book "Giant Brains," will act as chairman.

A panel of qualified, top representatives of firms actively engaged in development of electronic "computer" type devices have been invited to speak, and to answer written questions from the floor, in non-technical terms. Many of the devices discussed may lend themselves economically to applications in traffic, operating, accounting and executive functions of the railroads. "Computer" type electronic devices have a wide variety of applications, ranging from car retarder controls to electronic "brains."

The forum, which will be held all day Friday, April 24, will feature as guests: M. E. Mengel, special representative of the Burroughs Adding Machine Company; R. E. Sprague, vice-president, applications and sales, of the Computer Research Corporation; W. B. Hebenstreit, associate head, advanced electronics laboratories, Hughes Aircraft Company; Leonard Swanson, representative—applied science department, International Business Machines Corporation; Arthur Katz, assistant director, Univac application department, Remington Rand, Inc.; and Dr. Samuel Lubkin, technical director, electronic computer division, Underwood Corporation.

A complete program covering the balance of the meeting will be published in next week's *Railway Age*.

at the same time a year ago. "This," he stated, "has been beneficial in solving car service and repair problems, and the roads are now in better position to maintain their own property—especially when major repairs are needed."

The board went on record as opposing the St. Lawrence Waterway project, and advocating organization of clinics for men "on the ground" to impress upon them the importance of car service rules.

Another development of the meeting was an agreement by all roads in the territory to conduct a two-week survey (April 16 to May 1) on L.C.I. shipments, the purpose being to determine causes of delay and to make recommendations at the June meeting on a cooperative policy to improve less-carload service.

By vote of the board, a campaign will be launched at once to reach those in the territory who in the past have been guilty of releasing dirty

cars. H. N. Hill, chairman of the Car Efficiency Committee, told members that action had to be taken soon to alleviate this condition to avoid the possibility of the Interstate Commerce Commission levying a penalty on unclean cars.

F.R.P. Annual Dinner Will Be at Cleveland March 26

Three awards and a panel discussion will mark the sixth anniversary dinner of the Federation for Railway Progress in the Hotel Cleveland, on March 26. The principal address will be made by Robert R. Young, founder and chairman of the federation and also chairman of the Chesapeake & Ohio. More than 800 persons are expected to attend.

A bronze plaque, an annual award, will be presented to a railroad "in recognition of outstanding achievement in progressive passenger service." Two special awards will also be presented. One will be given for "outstanding contributions to the public relations of the railroad industry," and another, known as the Annual Journalism Award, will be presented for "outstanding reporting of news of the railroad world."

The awards will be presented by Walter J. Tuohy, C&O president and member of the executive council of the federation. Louis B. Seltzer, editor of the *Cleveland Press*, will serve as toastmaster, and Thomas J. Deegan, Jr., president of the federation, will report on its activities. Senator Charles W. Tobey, chairman of the Senate Interstate and Foreign Commerce Committee, will be interviewed as "The Man of the Week."

The Great Lakes Regional Advisory Board will hold its 30th annual and 84th regular meeting on March 24-25, at the Hotel Statler, De-

troit. Karl A. Borntrager, vice-president—operations and maintenance of the New York Central, will speak at the morning session on the 25th, and William H. Schmidt, Jr., executive editor of *Railway Age*, at a joint luncheon session given in cooperation with the **Traffic Club of Detroit**. Mr. Schmidt's subject will be "Railroads Are a Business, Too."

The **National Defense Transportation Association** will move to new headquarters at 1001 Connecticut avenue, Washington, D.C., on or about April 1.

W. Arthur Grotz, president of the Western Maryland, will be guest speaker at the luncheon session of the 68th meeting of the **Allegheny Regional Advisory Board**, to be held March 26, as reported in *Railway Age* March 9.

The **Traffic Club of New York** has announced the following events: Dinner and business meeting at the Biltmore Hotel March 31; annual golfers luncheon at the Biltmore, April 7; and a Kiddies' Easter Party at the Hotel Commodore, April 4.

The New York division of **Railroad Enthusiasts, Inc.**, will hold its next meeting March 31 at 8 p.m. Howard B. Blanchard, special representative for the Union Pacific at Washington, D.C., will speak on "The Union Pacific."

Arthur A. Adams, formerly regional manager of the liquid division of the office of Defense Transportation in Chicago, has joined the staff of the **Michigan Manufacturers' Association** at Detroit. Mr. Adams will specialize in assisting small manufacturers in Michigan with their transportation problems and in general service to outstate members.

Equipment & Supplies

Fuel-Cost Trend Favors Turbine

Walter J. Tuohy tells annual meeting of Bituminous Coal Research that a practical coal-burning gas turbine will open new, limitless market for coal

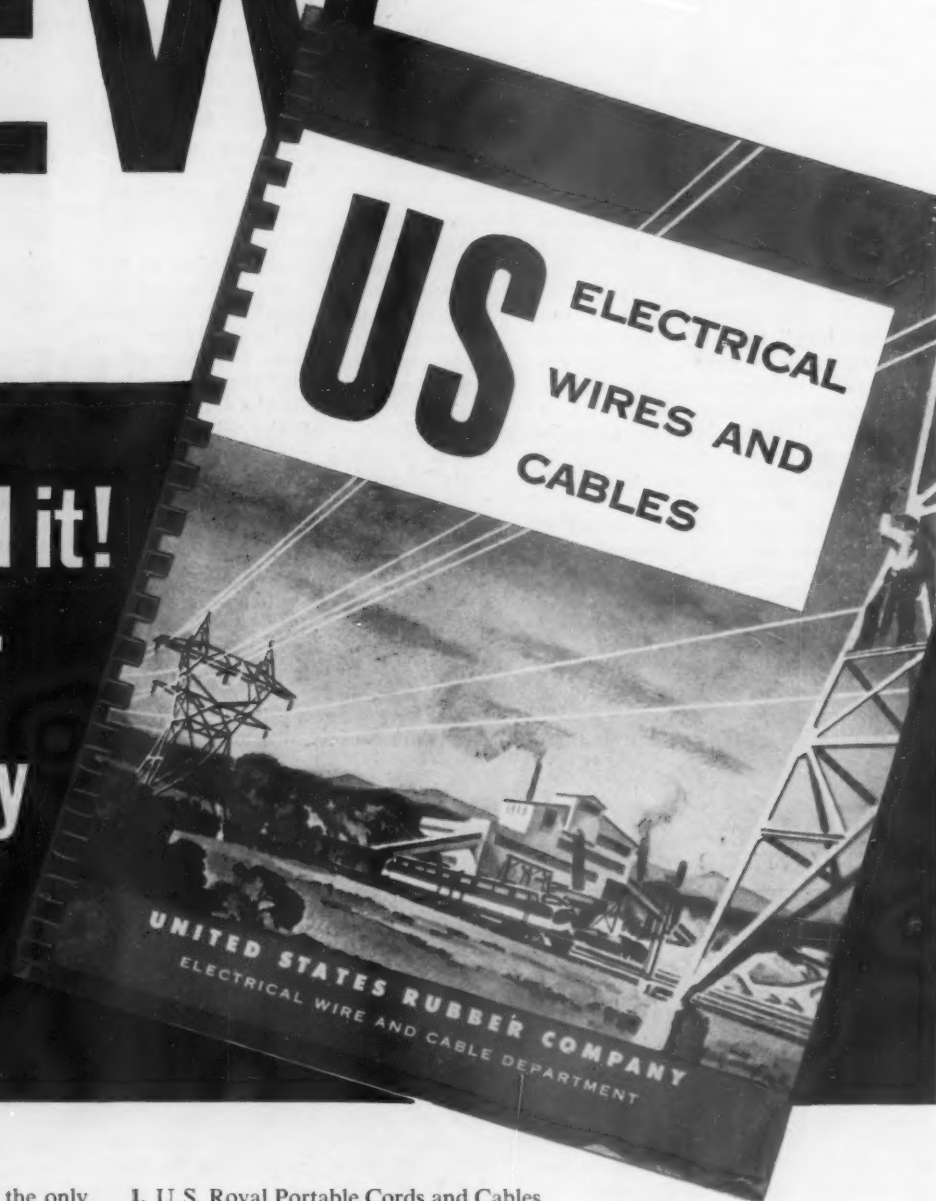
Current studies indicate a coal-burning gas turbine locomotive, in economic terms, "will just about compete with diesels, maybe save a little," Walter J. Tuohy, president of the Chesapeake & Ohio, said in an address to the recent annual meeting of Bituminous Coal Research, Inc., in Cincinnati. "The margin is nothing like that of diesel over steam power," he emphasized. "Consequently, our competi-

tive position is a tough one. The one thing in our favor is the anticipated trend in fuel costs. A shift to higher costs for oil and lower costs for coal would make our hopeful locomotive extremely attractive and assure its large scale use when its development is completed."

Mr. Tuohy said the diesel locomotive demonstrated real economies and superior performance 20 years ago, but

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only recently has the changeover to diesel power reached really large proportions. "Normally, another 20 years would pass before our gas turbine project [*Railway Age*, March 16, page 23], could duplicate this feat. Fortunately, however, the time between discovery of basic knowledge and its commercial use is getting shorter with our country's accumulating experience. If we meet with the success we think we see ahead, our project may reach the use stage in much less than the old normal interval."

The Locomotive Development Committee of B.C.R. never intended to manufacture locomotives, the C&O chief executive pointed out. "It has carried on only a scrimmage until some locomotive builder was ready to run with the ball," he said. "One builder has now made a pass . . . The entrance of the American Locomotive Company as a major participant in the Locomotive Development Committee program marks the first step in commercializing the research achievement of the committee."

"The continued interest of us all in carrying forward this research and development project is vital to its success," Mr. Tuohy concluded. "The building of a practical coal-burning gas turbine locomotive will not only improve railroad efficiency and hold coal consumption against other fuels. It will open up an entirely new field—the application of the coal-burning gas

turbine power unit in stationary plants and the consequent consumption of coal in large quantities. This is a new fuel market with limitless opportunities."

It was urged by L. C. Campbell, vice-president, Eastern Gas & Fuel Associates, in a paper on "Coal Utilization Research," that an organization be built out of B.C.R. which will help coal, as well as its users, find its proper place economically in the business world. Such an organization, he said, would bring together the National Coal Association, railroads and water transportation facilities, the chemical industry, and many others.

L. Newton Thomas, president of the Carbon Fuel Company, said one of the reasons for the loss of coal customers in recent years was the steady increase in transportation costs and their effect on the cost of coal. "Despite the fact that we were told by the railroads that their adoption of the diesel engine would result in substantially lower costs," he said, "we have not yet seen these lower costs reflected in lower rail rates."

IRON & STEEL

The 1953 program of the Seaboard Air Line includes laying 77 miles of 132-lb. rail and 76 miles of 115-lb. rail, John W. Smith, SAL president, told a recent luncheon meeting of the New York Society of Security Analysts.



FOR THE FOURTH TIME, Headquarters & Headquarters Company, 3rd Transportation Military Railway Service, has been awarded a Unit Commendation "for exceptionally meritorious conduct in performance of outstanding service in support of combat operations in Korea." This fourth commendation covered the period from April 1, 1951, to August 21, 1952.

General American, which owns and operates a large fleet of tank cars, originally set out to develop a process for the interior coating of cars designed to carry corrosive chemicals and materials which must not be contaminated by "pick-up iron" from the tank-car metal. Up to this time it has been necessary to finish certain tank-car interiors with several coats of baked-on enamel—a process which is expensive, time-consuming, and lasts only three to five years. It was believed that nickel plating would prove the ultimate solution, but the continuous electroplating of so large a surface as the interior of a tank car is very difficult under present limitations of the electroplating process.

General American's research group, according to Mr. Stebler, succeeded in developing the "Kanigen" process through reduction of nickel by use of hypophosphites, a principal upon which the National Bureau of Standards had done considerable work several years earlier. After the process was perfected in the laboratory, a pilot plant was built at East Chicago in the summer of 1952 and has been in constant service since. Because the throwing power of this process is 100 per cent, it has been found practical for pieces of any shape or size, and will prove eminently satisfactory for its intended purpose—the interior coating of tank cars. This, according to Mr. Stebler, will be the next step after construction of the presently planned plants. A special unit is to be designed large enough to accommodate tank-car tanks and large vessels as soon as a nickel supply is assured for this purpose. "Kanigen" plate is a nickel-nickel-phosphide composition. Normal "Kani-

Supply Trade

"Kanigen" Nickel-Plating Process

General American develops hot chemical bath which produces a thin non-porous coat on many materials

The availability of an entirely new process of nickel plating, which greatly stretches the available nickel supply and which "may well prove to be one of the most far-reaching industrial developments since World War II" was announced March 16 by William J. Stebler, executive vice-president of the General American Transportation Corporation.

General American will immediately build two new plants, one at East Chicago, Ind., and the other at Los Angeles, to utilize the new process. These plants are expected to be in operation by the third quarter of 1953. Thereafter, other firms will be licensed to use the process, since its applications appear to be so wide that no one organization can meet all requirements.

The new process, which requires no electrolytic equipment, has been named "Kanigen." "It is so completely manageable," Mr. Stebler states, "that it opens up vast new possibilities; intricate valves and other products pre-

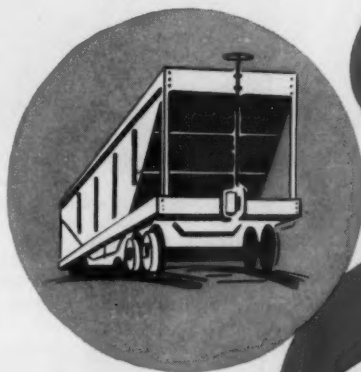
viously impossible to plate successfully can be covered thoroughly; parts subject to hard wear and abrasion may be continuously coated and hardened far beyond the capacity of the parent metal; over-machined parts may be brought back to proper tolerances; parts previously machined of monel metal and other corrosion-resisting materials can now be of cast steel and plated to a thickness of three mills with assurance that the plate will nowhere vary from that thickness, with a consequent saving of expense and critical material."

The process, it is claimed, will plate any article uniformly, regardless of size or shape. It has proved satisfactory for the production-line plating of steel, copper, brass, bronze, stainless steel and aluminum. Tests on plastics and magnesium indicate that these materials will prove practical for "Kanigen" plating. The coverage of "Kanigen" is complete and "its porosity is virtually zero," said Mr. Stebler.

SAVE TIME and MONEY

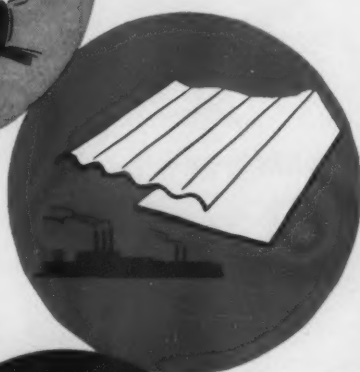
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—for protecting underframes and car end walls against rust, corrosion and abrasion. Effectively seals out dust and moisture. Can be applied by spray or brush.



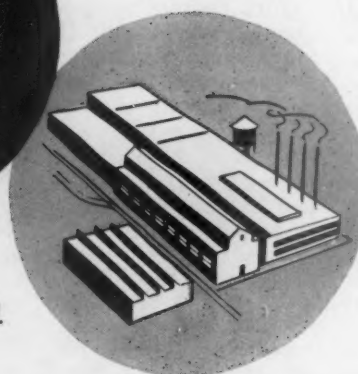
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—thirsty fibers of asbestos that soak up oil, water, grease, chemicals. Use in diesel shops to help maintain safety underfoot. Approved by Underwriters' Laboratories, Inc.



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Battery Sealing Compound
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Smoke Jacks
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gen" platings run about 5 to 8 per cent phosphorus and have a Vickers hardness of 550-650 (Vickers 600-Brinell 535). Its ductility is very low and it is not recommended for parts which will be subjected to considerable flexing, such as springs. Its adhesion is excellent. Its minimum thickness is within 10 per cent of average thickness, while electrolytic nickel can run from 25 to 200 per cent in variations between minimum and maximum. In typical applications, even on a large scale, "Kanigen" is not likely to show any pores even at plating thicknesses of a half-thousandth of an inch. Plated steel test specimens pulled to failure in a tensile machine show no flaking or chipping of the plating. Its coefficient of expansion is .000013 per deg. C.

Economics

The comparative cost of "Kanigen" plating, depending upon the object, can vary from close to "break even" to a very decided saving. "Kanigen" requires less nickel to do a given job, though material cost per pound of deposited nickel from a chemical bath is substantially greater than for one pound of nickel deposited electrolytically. For thin coatings "Kanigen" is much more economical than electroplate. This advantage decreases with thickness, though thick coats are rarely required with "Kanigen."

United States Steel Plans Research Center

A site near Pittsburgh has been chosen by the United States Steel Corporation for a new research center, which will be devoted both to applied research and to coordination of projects currently under way in U.S.S. laboratories at plants throughout the country.

Military requirements will be the basis for much of the immediate work to be undertaken although industry-wide problems—such as how to offset deteriorating quality of available raw materials—also will be studied. A design submitted for the center proposes three buildings with a combined floor area of approximately 132,000 sq. ft.—a main laboratory building, an experimental engineering shop, and an industrial process development building.

1953 Diesel Purchases to Rise, Say B.-L.-H. Officers

"While a number of roads have practically completed their [diesel] conversion programs, there are still many diesel locomotives to be purchased, particularly for freight service," Marvin W. Smith, president, and George A. Rentschler, chairman, said in the Baldwin-Lima-Hamilton Corporation's annual report for 1952. "With a substantial replacement potential still ahead, it is expected that the railroads will increase purchases in 1953 up to

levels more nearly approaching the average for recent years," they added. "Requirements for maintenance also provide a growing market for renewal parts."

As a result of the company's efforts to expand other operations, as well as steps taken toward diversification, Messrs. Smith and Rentschler pointed out, the locomotive business has become a smaller percentage than heretofore of the firm's total business. "In 1952," they said, "locomotives and replacement parts represented 30 per cent of our consolidated shipments as compared to 45 per cent in 1951 and as high as 75 per cent within the past five years."

D. O. Brooks has been appointed sales manager of the **Electro-Motive Division of General Motors**, while



D. O. Brooks

W. R. Instone has been named branch representative of the Jacksonville factory branch. Mr. Brooks joined Electro-Motive as a stock clerk in 1939 and



W. R. Instone

progressed to branch representative, which position he held before his present appointment. Mr. Instone joined Electro-Motive in 1950 following six and one-half years in the U. S. Navy. He served as senior clerk prior to his present appointment.

Rearrangement of distribution control points into six rather than seven sales and service regions has elimin-



Dan Stearns

ated the **Clark Equipment Company's** North Central and West Central regions, and has introduced a new



Glen R. Johnson

Midwestern region, headed by **Dan Stearns**, former North Central region manager. Assisting him will be **Glen**



A. G. Morrison

R. Johnson, who has served as national account representative for the past six years. **Al G. Morrison**, who



C. P. McDonald, who has been appointed sales engineer for the transportation division of the Minneapolis-Honeywell Regulator Company. With headquarters in Washington, D. C., Mr. McDonald will cover the southeastern part of the United States, handling sales and servicing of controls for railways, buses, streetcars and other transportation vehicles. The area formerly was covered out of the company's Philadelphia office.

has been manager of Clark's Central West region, has been named a dealer, taking on new sales territory which comprises, roughly the western half of Michigan. Associated with him will be Stephen C. Lobdell, who has been assistant regional manager, and Thomas R. Zelinsky, formerly a sales representative for the Detroit dealer. The new dealership, to be known as Morrison Industrial Equipment Company, will have its main sales and service installation at Grand Rapids.

The Magnaflux Corporation, Chicago, has moved to a new and larger plant at 7300 West Lawrence Avenue.



Walter M. Waldbauer, who has been appointed field engineer for the Lord Manufacturing Company. Mr. Waldbauer will cover the northwestern Ohio section, with headquarters at 811 Hanna building, Cleveland. He formerly was a project engineer at the company factory.

All manufacturing and engineering activities, as well as the company's general offices, have been removed from the old plant.

Ross W. Bennington has been appointed to the newly created position of general traffic manager of the United States Rubber Company, with headquarters as before at Rockefeller Center, New York.

Albert H. Clem, formerly assistant general sales manager, has been appointed general sales manager of the Pennsylvania Salt Manufacturing Company, to succeed Russell S. Roeller, deceased.

Marvin J. Kolhoff has been appointed manager of the locomotive and car equipment department laboratory of the General Electric Company at the Erie, Pa., works.

H. H. Morgan has been elected president of the Robert W. Hunt Company, and W. J. Bongard, vice-president. Other officers are: Vice-

president, L. H. Stott; secretary, S. C. Sexauer; and treasurer, W. F. Anderson.

Joseph T. Ryerson & Son, Inc., has begun construction of a new steel service plant in Milwaukee. Site of the new building, which will replace the present plant at 320 South 19th street, is at South 84th street and the Chicago, Milwaukee, St. Paul & Pacific railroad. The plant will consist of two large building units and an office building and will have approximately 166,000 sq. ft. of floor space, about three times present plant capacity.

OBITUARY

Robert H. Gardner, 58, general sales manager of the A. M. Byers Company, died recently in the Allegheny General Hospital, Pittsburgh, after a brief illness.

Harry C. Smith, secretary and treasurer of the Frost Railway Supply Company for 48 years, died recently in St. Petersburg, Fla.

New Facilities

New 165-Mile Line Proposed in Canada

Representatives from northwestern Quebec have asked Canadian Transport Minister Lionel Chevrier to urge construction of a Canadian National line from Beattyville, in the Abitibi district, to the mining center of Chibougamau, 165 miles. Building of such a railway was said to be the only means to assure full development of the Quebec area, described as rich in minerals, farm lands and forests.

Cost of the extension was estimated by the territorial delegation at \$14 million. They set annual operating costs at \$4 million and predicted that the line would obtain revenues of at least \$5 million to \$6 million a year.

The CNR also plans to start this spring a "referendum survey" of the Lake St. John-Saguenay district in the northeastern part of Quebec province, which has been described as "one of the brightest spots in future Canadian industrial expansion." Donald Gordon, CNR president and chairman, is reported to have told a delegation from the area that the CNR "is thinking in terms of improved railway connections and branch line extensions" there, but that "the mileage of any new construction would be so substantial that it must be done in stages."

Atchison, Topeka & Santa Fe.—Has ordered from the Union Switch & Signal Division, Westinghouse Air Brake Company, material to install centralized traffic control on approximately 141 miles of single track between Newkirk, Okla., and Purcell.

The 17½-ft. control machine will be installed at Arkansas City, Kan., division headquarters. Installation will be handled by railroad forces.

Bevier & Southern.—The I.C.C. has authorized this road to build a 4.8-mile extension to its present line at Ardmore, Mo. The line will serve the so-called Darksville coal field, an area containing approximately 2,500,000 tons of coal. Most of the material and labor for constructing the new line will be furnished by the Chicago, Burlington & Quincy, with which the B&S connects at Bevier, Mo. Total cost of the new trackage is estimated at \$160,285.

Chicago & Illinois Midland.—Three projects—representing an expenditure of \$740,000—have been scheduled for 1953. The largest is construction of Kinney yard at Taylorville, Ill., to serve the Peabody Coal Company's Mine 11. Grading was completed under contract as part of the 1952 program, but remaining work is expected to cost about \$425,000. A bridge over the Sangamon river near Springfield will be rebuilt at a cost of \$301,000, with steel construction on concrete piers and trestle approaches. Part of the work will be handled by company forces. The company is also installing grade crossing protection at a point near the Springfield shops, at a cost of about \$12,800.

Chicago, Indianapolis & Louisville.—Major construction projects scheduled for 1953 total slightly over \$1 million. The largest single expen-

Take the **BITE** out of tie plates!



YOU DO JUST THAT WITH SHOCK-ABSORBING SISAL FIBRE TIE PADS, MADE WITH VINYLITE BRAND RESINS!

These tough, resilient tie pads soak up the jolting, pounding pressures of tie plates—keep them from mashing and cutting into crossties. With their self-sealing coating, the pads hug the tie surface, close tightly around the spikes as they're driven through—preventing destructive moisture, sand and cinders from getting under the tie plate. This positive protection of the crosstie even makes it possible to use smaller tie plates! *The tie pad pictured above impregnated with VINYLITE Brand Resins was applied to a 24 year old tie.*

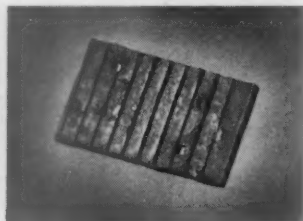
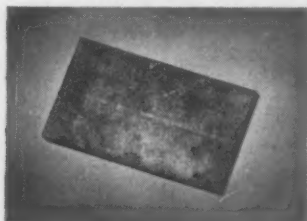
Whether used on 70 mph mainline or on a hardworking factory siding, sisal fibre tie pads made with VINYLITE Resins can add years to crosstie life, prove a substantial factor in cutting operating costs. And there are other valuable fea-

tures. Tests in track on major railroads have shown that these tie pads also improve maintenance of line, surface and gauge of track, especially on curves. Regular and insulated joints have longer life; rail end batter is substantially reduced.

You'll find that tie pads made with VINYLITE Resins stand up! They offer great resistance to weather, brine, oil, acid, alkali, fungus, vermin and insects. Neither extreme heat nor intense cold affects their performance.

Get the complete story on VINYLITE Brand Resins by writing Dept. PM-73. Ask for the booklet, "VINYLITE Resins and Plastics—Their Forms, Properties, Applications."

Data courtesy of Bird & Son, Inc., East Walpole, Mass.



Compare these Tie Pads. Both are made of sisal fibre with VINYLITE Resins. On the left a new, unused tie pad. On the right the same type pad taken from 70 mph mainline track after 1 year, 3 months of service. Note how its surface, marked by the tie plate, absorbed the plate pressure without disintegration or loss of shape.

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BAKELITE COMPANY
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diture (\$724,000) covers 18 miles of new 115-lb. rail to be installed at several locations. Other improvements, and the estimated cost of each are: New passenger stations at Lowell, Ind., and Monon (\$40,000); new track scale at Wallace Junction (\$30,000); search-light signals in the 22-mile territory between Rensselaer and Reynolds (\$50,000); replacement of a truss span at Bridge 174.8 on the Indianapolis line with deck plate girders (\$70,000); and extensive rearrangement of part of the yard at Lafayette. This work will include lowering of the main line and two yard tracks and provision of satisfactory drainage; construction of a new incline track from yard to the diesel shop; construction of a bin-type retaining wall; respacing of yard tracks, and relaying with heavier steel—all at a total estimated cost of \$90,000.

Florida East Coast.—Contracts for a freighthouse, tracks and driveways at Fort Pierce, Fla., have been awarded to the Statewide Construction Company, Vero Beach, Fla., and the Cleary Brothers Construction Company, West Palm Beach. Estimated cost of the project is \$90,000.

Illinois Central.—The Kentucky & Indiana Terminal will oppose this road's plan for constructing a 1.1-mile extension to serve the Paddy's Run plant of the Louisville Gas & Electric Co. (*Railway Age*, February 23, page 23). The plant, a large user of coal, already is served by the K&IT. The Baltimore & Ohio, the Southern and the Chicago, Indianapolis & Louisville, proprietary roads of the K&IT, joined in obtaining I.C.C. authority to intervene in the case.

Louisville & Nashville.—Newly authorized projects involving an expenditure of \$25,000 or more total nearly \$1 million. They include: Construction of 3.22 miles of spur track to serve the Alabama By-Products Company, Praco, Ala.—\$604,000; construction of a 6,600-ft. industrial lead track at Strawberry, Ky.—\$53,000; paving (concrete) of area in vicinity of production line at South Louisville, Ky., shops—\$33,614; relining of Lesters tunnel, Birmingham division—\$32,692; reconstruction of south approach of Chickasaw Bogue drawbridge, Montgomery, New Orleans & Pensacola division—\$104,590; repairs to Trestle No. 7, same division—\$44,246; and construction of a wye and interlocker at Heidrick, Ky.—\$106,598.

Oregon Electric.—Additional storage trackage at Albany, Ore., yard is being planned and is expected to be undertaken very shortly. The cost has been estimated at \$143,100. This subsidiary of the Spokane, Portland & Seattle also contemplates extension of storage tracks at Eugene, Ore., at a cost of about \$52,600; and replacement of a bridge with a 12-ft. by 12-ft. re-

inforced concrete box and fill at a cost of \$38,000.

Oregon Trunk.—Replacement of a bridge with steel spans on concrete abutments is being planned by this subsidiary of the Spokane, Portland & Seattle. The project is expected to cost about \$45,000.

Spokane, Portland & Seattle.—Track revisions in Willbridge yard at Portland, Ore., are expected to cost about \$60,000. Also proposed is installation of a 100,000-bbl. diesel fuel tank farm at Linnton, Ore., at an estimated cost of \$237,000. Both projects are "in the planning state and to be undertaken before too long."

Financial

L.I. Transit Authority Calls Wyer "Uncooperative"

Rehabilitation of the Long Island will not be started for many years if the policies of Trustee William Wyer are followed, the Long Island Transit Authority said last week in asking the New York State Public Service Commission to take immediate action to force the trustee to rehabilitate the road without delay.

Authority members said their efforts toward an early solution of the LI's

Selected Income and Balance-Sheet Items of Class I Steam Railways in the United States

Compiled from 127 reports (Form IBS) representing 131 steam railways
(Switching and Terminal Companies Not Included)

Income items	United States			
	For the month of October 1952	For the month of October 1951	For the ten months of 1952	For the ten months of 1951
1. Net railway operating income.....	\$120,668,576	\$125,802,323	\$853,008,992	\$732,823,905
2. Other income.....	16,904,771	18,350,471	178,431,802	185,092,329
3. Total income.....	137,573,347	144,152,794	1,031,440,794	917,916,234
4. Miscellaneous deductions from income.....	3,990,605	4,214,377	40,545,586	46,687,339
5. Income available for fixed charges...	133,582,742	139,938,417	990,895,208	871,228,895
6. Fixed charges:				
6-01. Rent for leased roads and equipment.....	11,765,735	9,408,692	104,038,794	92,278,000
6-02. Interest deductions ¹	26,448,036	25,449,024	261,370,290	249,955,001
6-03. Amortization of discount on funded debt.....	244,485	248,544	2,448,164	2,384,262
6-04. Total fixed charges.....	38,458,256	35,106,260	367,857,248	344,617,263
7. Income after fixed charges.....	95,124,486	104,832,157	623,037,960	526,611,632
8. Other deductions.....	3,051,778	3,000,766	29,733,273	31,096,518
9. Net income.....	92,072,708	101,831,391	593,304,687	495,515,114
10. Depreciation (Way and structures and Equipment).....	41,405,124	40,361,020	402,158,969	393,635,015
11. Amortization of defense projects.....				
12. Federal income taxes.....	84,573,928	70,146,427	507,357,929	451,262,143
13. Dividend appropriations:				
13-01. On common stock.....	20,248,721	14,649,827	186,846,440	163,548,938
13-02. On preferred stock.....	5,462,222	4,773,286	59,290,729	73,855,497
Ratio of income to fixed charges (Item 5 ÷ 6-04).....	3.47	3.99	2.69	2.53
Selected Expenditure and Asset Items				
United States Balance at the end of October				
1952 1951				
17. Expenditures (gross) for additions and betterments—Road.....	\$314,585,211	\$281,853,154		
18. Expenditures (gross) for additions and betterments—Equipment.....	796,524,593	857,265,917		
19. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707).....	482,323,570	477,507,644		
20. Other unadjusted debits.....	87,189,810	116,504,907		
21. Cash.....	941,847,188	885,379,486		
22. Temporary cash investments.....	984,959,355	874,659,702		
23. Special deposits.....	85,268,820	61,928,349		
24. Loans and bills receivable.....	1,094,848	2,039,823		
25. Traffic and car-service balances—Dr.....	72,080,981	63,786,278		
26. Net balance receivable from agents and conductors.....	168,650,111	174,448,053		
27. Miscellaneous accounts receivable.....	372,214,554	393,894,767		
28. Materials and supplies.....	856,211,108	911,825,191		
29. Interest and dividends receivable.....	15,792,182	13,787,229		
30. Accrued accounts receivable.....	229,964,133	219,510,654		
31. Other current assets.....	39,232,719	35,195,546		
32. Total current assets (Items 21 to 31).....	3,767,315,999	3,636,455,078		
Selected Liability Items				
40. Funded debt maturing within 6 months ²	\$221,069,199	\$166,737,586		
41. Loans and bills payable ³	3,140,990	3,815,485		
42. Traffic and car-service balances—Cr.....	106,930,806	101,423,918		
43. Audited accounts and wages payable.....	532,561,318	557,585,995		
44. Miscellaneous accounts payable.....	216,094,897	196,269,208		
45. Interest matured unpaid.....	29,877,031	29,106,128		
46. Dividends matured unpaid.....	4,600,316	3,879,633		
47. Unmatured interest accrued.....	82,021,651	80,192,931		
48. Unmatured dividends declared.....	42,836,084	32,473,996		
49. Accrued accounts payable.....	218,177,278	252,999,182		
50. Taxes accrued.....	929,733,397	877,106,603		
51. Other current liabilities.....	123,951,069	95,051,350		
52. Total current liabilities (Items 41 to 51).....	2,289,924,837	2,229,904,429		
53. Analysis of taxes accrued:				
53-01. U. S. Government taxes.....	737,618,553	696,513,547		
53-02. Other than U. S. Government taxes.....	192,114,844	180,593,056		
54. Other unadjusted credits.....	284,974,089	302,243,174		

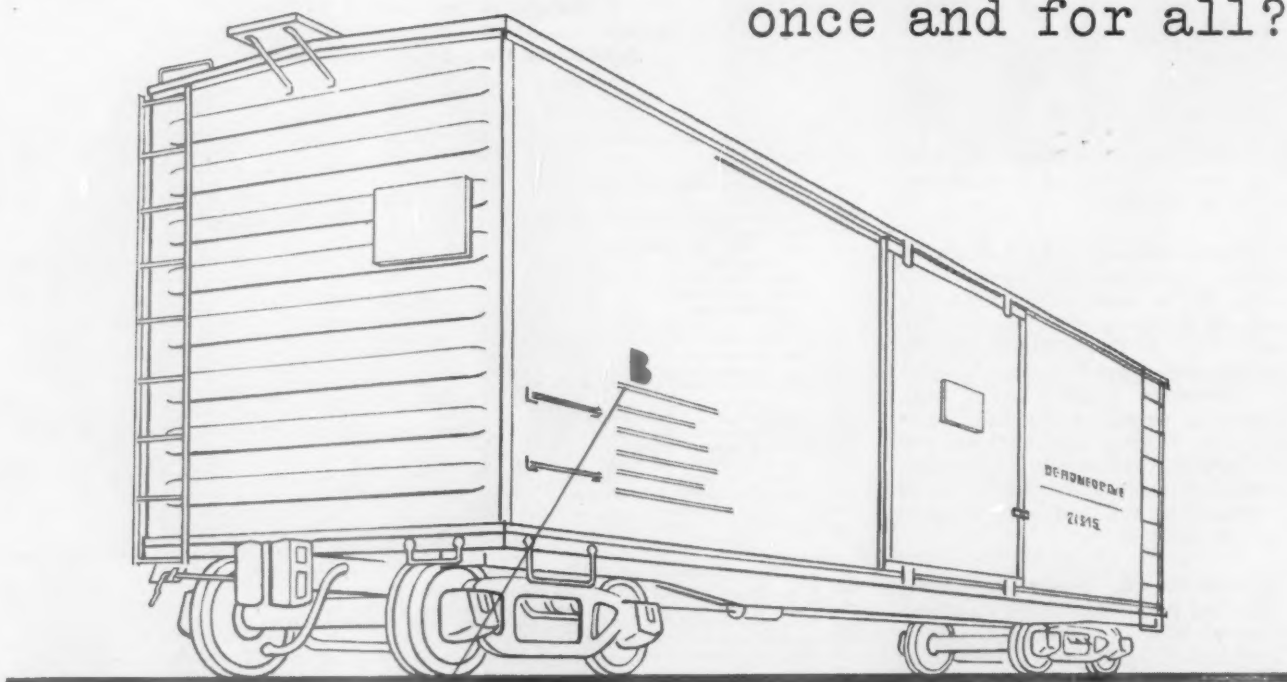
¹ Represents accruals, including the amount in default.

² Includes payments of principal of long-term debt (other than long-term debt in default) which becomes due within six months after close of month of report.

³ Includes obligations which mature not more than one year after date of issue.

Compiled by the Bureau of Transport Economics and Statistics, Interstate Commerce Commission. Subject to revision.

Did you know... that you can install the Bishop System of Infestation Control in both ends of a box car for about \$15, or in the whole car for around \$90, ...and get rid of insect infestation once and for all?



B
THE SIGN OF A CLEAN CAR

For full information on the Bishop System, contact your nearby Owens-Corning branch office for a copy of Booklet RR1.A1. Or write Owens-Corning Fiberglas Corporation, Dept. 21-C, Toledo 1, Ohio.

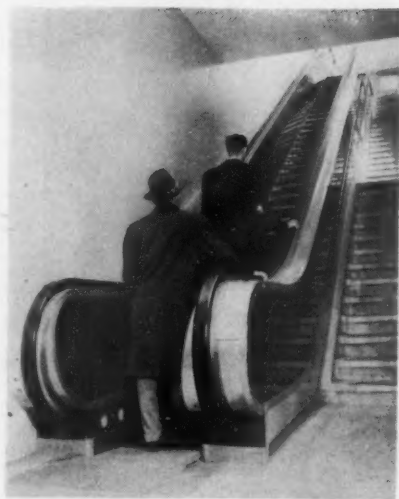
DIRT JUST CAN'T ACCUMULATE! The Bishop System stops infestation by utilizing a special white Fiberglas* wool. Under compression, the resilient fibers of glass completely fill the space behind the liners and preclude accumulation of dirt or lading. There simply is no space left, and nothing edible to attract insects or vermin. The result is a clean car that can be kept clean merely by sweeping the floor at time of delivery, easily and inexpensively.

17 CLASS 1 RAILROADS already have adopted the Bishop System, and have proved it thoroughly effective and economically practical. The above investment (cost of material) may be capitalized on both new and rebuilt cars. Remember, clean cars mean better service . . . fewer claims!

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FIBERGLAS

RAILROAD PRODUCTS

*Fiberglas is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for a variety of products made of or with fibers of glass.



THERE'S NOTHING unusual, nowadays, about escalators in railroad stations. What makes this one, in the Long Island's station at Rockville Center, N. Y., unique, is that it was installed by the municipality. A special act of the New York state legislature, giving the village an easement on the railroad's property, made it legal for the village to pay for the escalator installation to ease commuters' 22-foot climb.

problems had been blocked by the failure of the Pennsylvania to agree on a prompt reorganization and the failure of Mr. Wver "to cooperate with us" and his unwillingness "to proceed with . . . rehabilitation . . . even though funds will be available." Consummation of a reorganization plan at the current rate of progress is far removed, the authority said, but rehabilitation of the LI by "a cooperative trustee" could be going on concurrently with the "protracted fight . . . against the Pennsylvania in the reorganization proceedings."

"During the past two years great progress has been made in safety—largely at the expense of adequacy of service," the authority added. "The trustee recently instituted a program under which 17 cars per month will be given class repairs (*Railway Age*, February 2, page 16) . . . It does not begin to meet the Long Island's requirements for needed passenger equipment. This is the greatest need of the railroad."

"Quick Assets" Rose 12.2 Per Cent in 1952

"Quick assets" of Class I railroads increased 12.2 per cent in 1952—from \$1,743 million to \$1,955 million.

This was shown in the latest "Monthly Comment" of the Bureau of Transport Economics and Statistics, Interstate Commerce Commission. "Quick assets" are comprised of cash and temporary cash investments.

December 31, 1952's \$1,955 million was sufficient to cover 85.8 per cent of

total current liabilities reported by Class I roads as of the same date. The coverage ratio was 77.1 per cent on December 31, 1951.

The "Comment" article also showed that the Class I roads' net corporate working capital (total current assets less total current liabilities) increased from \$1,441 million on December 31, 1951, to \$1,519 at the close of last year, a rise of 5.4 per cent. Excluding materials and supplies, the increase was 27.9 per cent—from \$531 million to \$679 million. The materials and supplies account was down from \$909.6 million to \$839.8 million.

Canadian National.—*Net Surplus for 1952.*—In 1952 the CNR had a net surplus, the first in seven years, of \$146,000, Canadian Transport Minister Lionel Chevrier has announced in the House of Commons at Ottawa. The road, he added, will budget for another small surplus this year.

Delaware, Lackawanna & Western.—*Seeks Two Seats on Nickel Plate Board.*—The I.C.C. has authorized the Western Maryland to intervene in this proceeding. The WM told the commission it participates with two other roads in an important route between points on the Eastern seaboard and points on the New York, Chicago & St. Louis and beyond. This route is competitive with the Lackawanna-Nickel Plate route via Buffalo, N.Y. For this reason, the WM said, it fears the Lackawanna would gain a "definite advantage" if it were permitted to place two directors on the board of the Nickel Plate (*Railway Age*, September 8, 1952).

Pennroad Corporation.—*New President.*—Bradley Gaylord has been elected president, and Edward A. Merkle a director, to fill vacancies caused by the recent death of Benjamin F. Pepper.

Securities

CPR to Increase Capital Stock by \$50,000,000

Stockholders of the Canadian Pacific, at a special meeting to be held in conjunction with the May 6 annual meeting, will be asked to authorize an increase of \$50,000,000 in the ordinary capital stock. Approval would increase the stockholder-authorized ordinary stock from the present level of 18,000,000 shares of \$25 par value each to the 20,000,000 shares authorized by Parliament. Primary purpose of the increase would be to meet future demands for stock from holders of CPR convertible bonds.

Spokane International.—*Stock Split.*—The I.C.C. has approved this road's plan for splitting its common

stock. The road presently has 28,464 shares outstanding. It will issue an additional 142,320 shares, and will distribute these among present holders on the basis of five new shares for each share held. The I.C.C. noted that this is not a distribution of surplus, but subdivision of present stock into a greater number of shares. In seeking authority to make the split, the road told the commission that placing the shares in a "popular price range" would result in an increase in the number of stockholders (*Railway Age*, February 2, page 53).

Application

CHICAGO GREAT WESTERN.—To issue and sell \$6,000,000 of collateral trust bonds, proceeds from which would be used to pay off existing notes of \$3,000,000 and provide additional working capital. The bonds, dated April 1, would be sold by competitive bidding, and would mature April 1, 1978. The road asked authority to reissue and pledge \$9,000,000 of its first mortgage 4 per cent bonds, series A, as security for the new bonds.

Required dividend payments on cumulative preferred stock and the continuing program of additions and betterments have reduced working capital, the road told the I.C.C. It said it expects to spend about \$2,000,000 on additions and betterments during 1953.

DENVER & RIO GRANDE WESTERN.—To assume liability for \$9,990,000 of series "S" equipment trust certificates, to finance in part five diesel units and 1,700 gondola cars. Estimated total cost of this equipment is \$13,217,605.

Description and Builder	Estimated Unit Cost
5 1,500-hp. road-switchers (Electro-Motive Division, General Motors Corporation)	\$197,561
1,700 70-ton drop-bottom gondola cars (General American Transportation Corporation)	7,194

The certificates would be issued in three installments of \$3,330,000 each, with the first installment being sold by competitive bidding about May 1. This installment would be applied toward purchase of the five locomotives and 475 of the gondolas. All the series "S" certificates would be dated as of May 1, and the issue would mature in 30 semiannual installments of \$330,000 each, beginning November 1, 1953.

Authorization

ILLINOIS CENTRAL.—To assume liability for \$4,500,000 of series "37" equipment trust certificates, to finance in part 37 diesel units costing an estimated \$6,015,354 (*Railway Age*, February 9, page 92). Division 4 approved sale of the certificates for \$9,1459 with interest at 3 per cent—the bid of Halsey, Stuart & Co. and eight associates—which will make the average annual cost of the proceeds to the road approximately 3.14 per cent. The certificates, dated March 1, will mature in 30 semiannual installments of \$150,000 each, beginning September 1, 1953. They were reoffered to the public at prices yielding from 2.3 to 3.15 per cent, according to maturity.

NEW YORK CENTRAL.—To issue \$800,000 of 3¼ per cent promissory notes to the Bethlehem Steel Company in connection with acquisition of 15 all welded steel covered freight barges. The barges will cost an estimated \$1,012,500, and will be used by the road to handle port traffic at New York (*Railway Age*, February 9, page 92). The notes will be issued in accordance with a conditional-sale agreement with the steel company. Each note will mature in 20 consecutive quarterly installments.

Dividends Declared

CHICAGO & EASTERN ILLINOIS.—common, 50¢, payable April 3 to holders of record March 23, \$2 class A, 50¢, quarterly, payable April 3, July 16, October 16 and December 16, to holders of record March 23, July 1, October 1 and December 1. The common stock dividend is the first declared since December 1943.

CHICAGO GREAT WESTERN.—5% preferred, 62½¢, payable March 31.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—\$1, payable April 30 to holders of record April 7.

MAHONING COAL.—\$10, payable April 1 to holders of record March 23.

MAINE CENTRAL.—6% prior preferred, \$1.50,



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CUT YOUR COSTS

with Koppers pressure-treated wood

SAVINGS-MINDED railroad men find that they can make important savings on right-of-way fencing, on rolling stock, and on crossings by making them of pressure-treated wood.

Fences last more than 30 years!

The Chesapeake and Ohio Railway has installed more than 30,000 Koppers pressure-creosoted fence posts during the last three years. This move was based on the C&O's own comprehensive tests conducted from 1925 until 1949. Pressure-creosoted posts were still sound after 24 years of service and good for an estimated 20 more years. Such long service materially reduces yearly fencing costs.

\$125,000 saved per year on car lumber!

Pressure treatment of car lumber is another way to save money. Actual performance records prove that pressure-treated car lumber lasts 3 to 4 times longer

than untreated lumber. Service like that saves one prominent Eastern railroad more than \$125,000 a year on car decking alone. Pressure treatment of sills, running boards, roofing, and framing increases savings even more.

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Koppers Timber Panel Grade Crossings can save you money too . . . and they are good public relations. Your installation costs are extremely low because the pre-cut, assembled panels go into place easily. And when track is worked, the panels can be removed and replaced quickly. Their lasting smoothness and good looks create good will in the communities where they are used.

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Koppers Company, Inc.

Pittsburgh 19, Pa.

quarterly, payable April 1 to holders of record March 24.

PENNSYLVANIA.—(increased), 75¢, payable April 23 to holders of record March 23.

PITTSBURGH & LAKE ERIE.—\$1.50, quarterly, payable April 15 to holders of record March 20.

PROVIDENCE & WORCESTER.—\$2.50, quarterly, payable April 1 to holders of record March 16.

ST. LOUIS SOUTHWESTERN.—\$5, payable March 30 to holders of record March 23.

SPOKANE INTERNATIONAL.—new common, 25¢, quarterly, initial payment April 1, subsequent payments July 1, October 1 and December 15, to holders of record March 18.

June 16, September 15 and December 1. Stock dividend (five shares for each share held) payable to holders of record March 18.

TEXAS & PACIFIC.—common, \$1.25, quarterly, payable March 31 to holders of record March 24.

Security Price Averages

	Mar. 17	Prev. Week	Last Year
Average price of 20 representative railway stocks	69.47	68.42	58.85
Average price of 20 representative railway bonds	94.63	94.92	93.31

Railway Officers

EXECUTIVE

McGinnis Resigns as CofG Board Chairman

Patrick B. McGinnis has resigned as chairman and a member of the board of directors of the Central of Georgia, effective April 2. His resignation as a director of the Savannah & Atlanta, a CofG subsidiary, will be effective on the same date. In explanation of the move, Mr. McGinnis issued a statement to the press, portions of which follow:

"Information has been received by me that the Interstate Commerce Commission has set for public hearing April 9 my application to serve as director and chairman of the board of the CofG and as a director of the S&A. It is indicated that the hearing is to determine if I control any other railroad. I was elected to the CofG board as its chairman January 16, 1953. My name has since been mentioned frequently with that of the New Haven and with the Norfolk Southern. On January 15, 1953, I resigned from chairmanship of the NS and prior to that date disposed of my stock holdings therein. As for the New Haven, I have never held official connection therewith and own none of its stock.

"However, the I.C.C. has not yet released its decision in the NS hearing; the annual stockholders meeting of the New Haven is scheduled for April 8; the annual meeting of the voting trustees of the CofG is scheduled for April 2 and the voting trust does not expire until June 30, 1953. Having these events in mind, I believe that the clarity of the issues, regardless of their relevance, will best be resolved by my presently stepping aside from my CofG connections."

Mr. McGinnis' election to the CofG chairmanship was reported, and his

business career summarized, in *Railway Age* January 26, page 51.

As *Railway Age* reported February 9, **M. E. Gustaveson**, superintendent, has been elected vice-president operating of the **CHICAGO & ILLINOIS MIDLAND**. **James E. Dare** assistant to vice-president, Southern division, of the Public Service Company of Northern Illinois, at Harvey, Ill., has been ap-



M. E. Gustaveson

pointed executive assistant to president, of the railroad.

Mr. Gustaveson joined the C&IM in 1927 as a stationery stockman. He subsequently served as yard clerk and timekeeper. In 1944 he became assistant to general superintendent, and in 1948 succeeded to the position of superintendent.



James E. Dare

Mr. Dare was graduated from the University of Illinois in 1931, and since then has been with the Public Service Company of Northern Illinois, a Commonwealth Edison subsidiary, first as a student trainee, then as an industrial gas engineer, and subsequently in various administrative positions.

As reported in *Railway Age* February 9, page 92, **Harry C. Wyatt** has been named vice-president and general manager of the **NORFOLK & WESTERN** at Roanoke, Va. Mr. Wyatt was born in

Wythe county, Va., June 16, 1902, and joined the N&W in 1916 as a mail carrier during school vacations. He subsequently served as clerk, helper car repairer, and car repairer during later vacations. After graduation from Virginia Polytechnic Institute in June 1924, he joined the N&W permanently as special apprentice in Roanoke shops, later becoming shop inspector in shops at Roanoke; Bluefield, W.Va.; and Portsmouth, Ohio. Mr. Wyatt then served successively as assistant foreman and foreman at Iaeger, W.Va.; assistant road foreman of engines on the Pocahontas division; general foreman at Columbus; and assistant master mechanic on the Radford and Shenan-

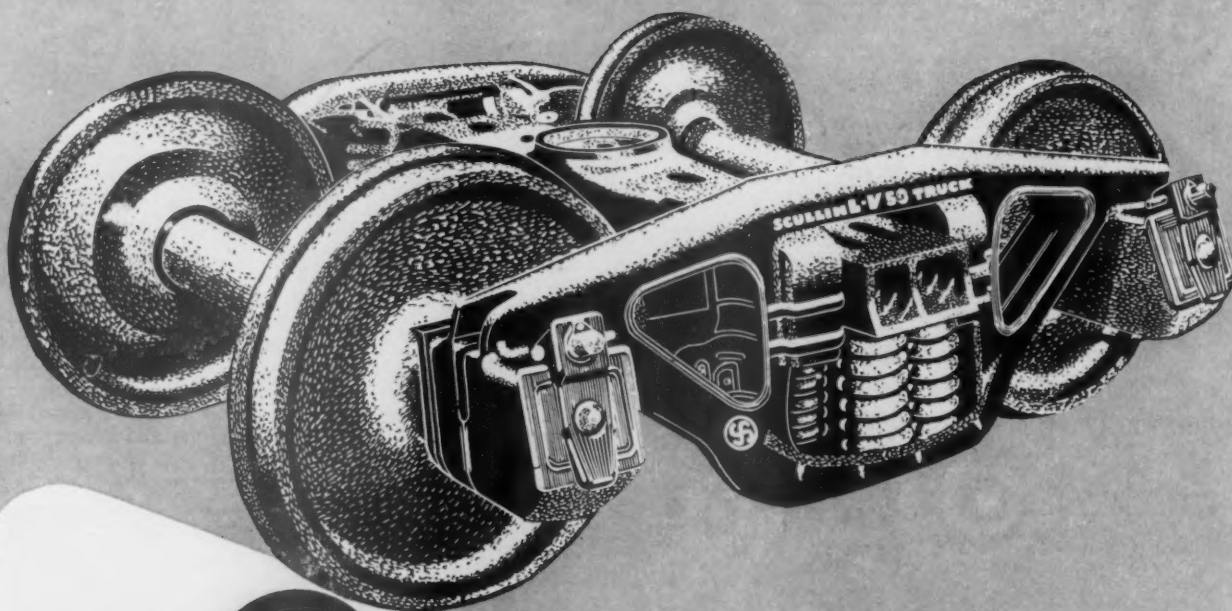


Harry C. Wyatt

doah divisions. He was appointed superintendent of the Shenandoah division in June 1939, transferring to the Scioto division in December 1940 and to the Pocahontas division in January 1942. He was named assistant general superintendent of motive power at Roanoke in February 1942, which position he held until his recent promotion.

As announced in the March 2 *Railway Age*, **Ferd W. Kuhn**, freight traffic manager of the **CHICAGO, INDIANAPOLIS & LOUISVILLE** has been elected vice-president—traffic; **Carl A. Bick**, comptroller, has been elected vice-president—operations; and **W. Paul Sullivan**, purchasing and tax agent, has been elected vice-president—public relations. Mr. Kuhn entered railway service with the Louisville & Nashville at Belleville, Ill., in 1913. He later joined the transportation department of Swift & Co. at Chicago, but went back to railroading in 1917 as tariff clerk in the Monon's general freight office there, returning in that capacity after World War I military service with the A.E.F. His subsequent career with the Monon included promotion to freight traffic agent at Chicago in 1920; general agent at Pittsburgh in 1923; general freight agent at Chicago in 1929; and his most recent appointment—as freight traffic manager—in 1947.

Mr. Bick entered railway service in (Continued on page 132)



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Denver & Rio Grande Western Railroad

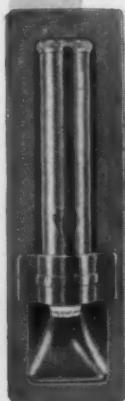


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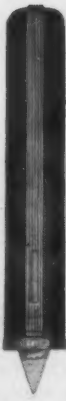
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• PATENTED

(Continued from page 129)

1909 as a clerk in the freight auditor's office of the Milwaukee, and joined the Burlington's accounting department in 1913. Following military service along the Mexican border and in World War I, he became department head, auditor



Ferd W. Kuhn

of freight accounts. He was appointed traveling station auditor in 1923, and chief clerk in the general auditor's office in 1927. Later he served as auditor of miscellaneous accounts, advancing to assistant auditor of expenditures in 1936. He became auditor of expenditures in 1946, leaving that po-



Carl A. Bick

sition to join the Monon as comptroller in 1950.

Mr. Sullivan joined the Monon as a section laborer in 1909. In 1914 he became a stenographer in the local freight office of the Big Four at LaFayette, Ind., but returned to the Monon in a similar capacity early in 1915. After service in the A.E.F. during World War I, he became chief clerk in the Monon's roadway office. From 1920 to 1937 he was chief clerk to engineer, maintenance of way, later holding a similar position in the office of chief engineer. In March 1940 he was appointed assistant to chief engineer; in 1943, chief engineering assistant and land and tax agent; and in

1947, land and tax commissioner. He assumed the duties of purchasing agent in January 1950.

FINANCIAL, LEGAL & ACCOUNTING

John E. McCullough, general attorney of the St. Louis-SAN FRANCISCO, has been named general solicitor (*Railway Age*, February 16), succeeding **James L. Homire**, who has been elected vice-president and general counsel. Mr. McCullough started



John E. McCullough

with the Frisco as an attorney in 1942, and was appointed general attorney July 1, 1949. Prior to joining the Frisco, Mr. McCullough had been in general law practice in Topeka, Kan., and had served as attorney and director of the Kansas Corporation Commission.

C. F. Gilroy, auditor freight accounts of the ATCHISON, TOPEKA & SANTA FE, has been named auditor of the Santa Fe's Coast lines, at Los Angeles (*Railway Age*, February 9). Mr.



C. F. Gilroy

Gilroy joined the Santa Fe in March 1913 at Williams, Ariz., as ticket clerk. He subsequently transferred to the accounting department at Los Angeles as traveling auditor; served as chief clerk in that department, and later



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Phillips and Clutch Head Screws • Lock Nuts • Cap Screws**

transferred to Topeka, Kan., as chief clerk to assistant general auditor. On August 1, 1940, he was appointed auditor freight accounts there.

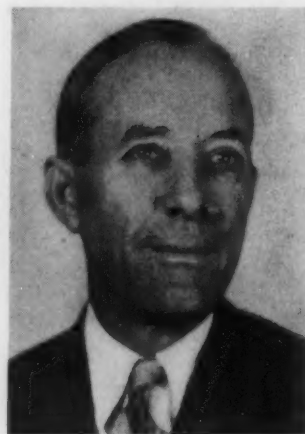
William R. Bready, III, and **Frederick E. Murphy**, assistant general solicitors of the PENNSYLVANIA, have been advanced to assistant general counsel, with headquarters as before at Philadelphia. Mr. Bready was born at Philadelphia March 15, 1908, and attended Havenford College (B.A., 1928) and the University of Pennsylvania Law School (LL.B., 1931). He engaged in private practice of law at

Philadelphia from 1931 to 1945, entering railroad service as an assistant solicitor with the Pennsylvania in 1945. Two years later he advanced to assistant general solicitor.

Mr. Murphy was born at New York October 15, 1904, and attended Holy Cross College (B.A., 1926) and New York University School of Law (J.D., 1929). He entered railroad service in 1926 in the real estate department of the Long Island, becoming tax agent in 1940. In 1944 he was appointed assistant tax agent of the Pennsylvania, becoming assistant solicitor in 1945 and assistant general solicitor in 1947.

OPERATING

J. E. Lester, superintendent of the ATCHISON, TOPEKA & SANTA FE's Colorado division, has been appointed assistant general manager at La Junta, Colo., while **J. P. Spears**, assistant superintendent of the New Mexico division at El Paso, Tex., succeeds Mr. Lester (*Railway Age*, February 9). Mr. Lester's Santa Fe service dates from 1918, when he started as an apprentice operator at Amarillo. By 1938 he had advanced to trainmaster on the



J. E. Lester

Slaton division and in 1940 became superintendent of the Pecos division. He has been superintendent, Colorado division, since February 1941.

Mr. Spears entered Santa Fe service as an operator in 1929. By 1947 he had become trainmaster, in which capacity he served on the Slaton, Colorado and Pecos divisions. He became assistant superintendent at El Paso in July 1951 and later served as acting superintendent at Pueblo, Colo.

T. L. Nichols, general superintendent of the ATLANTA & ST. ANDREWS BAY, has been elected general manager in charge of operations.

TRAFFIC

H. A. Weiss, traffic manager of the LONG ISLAND, has been appointed passenger traffic manager, and **K. M. Potter**, general freight agent, has been named freight traffic manager, both with headquarters as before at New York.

Carl P. Underwood, commercial agent of the ERIE at Chicago, has been appointed general agent at Springfield, Ohio, succeeding **J. L. Tjaden**, who has been promoted to division freight agent at Marion, Ohio. **Charles O. Ewing**, chief clerk to assistant vice-president at Chicago, has been promoted to general agent at Milwaukee, succeeding **Leslie T. Coulston**, who will retire March 31, after 32 years of service with the Erie.

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The photo to the left shows the ease with which the Libbey-ZONE Process permits application to any wood surface. Application is made by spray or brush. No skilled labor needed.



The right photo shows a completed Libbey-ZONE application to a typical wood trestle. The white surface is simple, inexpensive gravel aggregate held in place by the Libbey-ZONE coating. Practically fireproof.

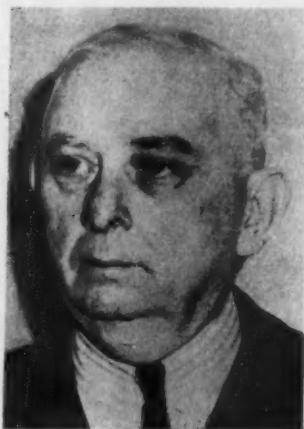
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As reported in *Railway Age* March 2, **J. D. Healy** has been appointed assistant traffic manager of the TEXAS & PACIFIC at Birmingham, Ala. Mr. Healy started his career as commercial agent at Fort Worth, Tex., in 1911, and



J. D. Healy

has subsequently served in numerous supervisory capacities in the traffic department at Shreveport, La., New Orleans, Fort Worth and Birmingham. He was appointed assistant general freight agent at Birmingham in 1946.

The CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA has announced the following appointments: **Roy L. Aker**, assistant general freight agent—rates as general freight agent—rates at St. Paul; **Cornelius R. Rierdan**, assistant general freight agent, as general freight agent at St. Paul; **Leo J.**

SPECIAL



Glen E. Morgan, assistant director of personnel of the Chicago & Eastern Illinois, has been named director of personnel, succeeding Ray Hill, who has been elected vice-president. Mr. Morgan joined the C&EI in 1927, and has served as assistant director of personnel since October 1951.



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Perry, as general freight and passenger agent at Duluth; and Earl S. Petersen, as district freight representative at Minneapolis. The positions of assistant general freight agent—rates, assistant general freight agent, and assistant general freight and passenger agent, formerly held by Mr. Perry, have been abolished.

Mr. Aker joined the CStPM&O in 1919 as a stenographer, and has held a number of clerical positions, including assistant chief clerk and chief clerk—rates. In 1948 he became assistant general freight agent after serving in the Navy from 1940 to 1946.

Mr. Rierdan entered railroad service as an office boy in 1906, and became chief clerk to freight traffic manager

in 1911. From 1924 until 1935 he was chief clerk of the general freight department, becoming assistant general freight agent in the latter year.

Albert Tansley, district passenger agent of the CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC at San Francisco, has retired after 48 years of service.

Vincent P. Brown, assistant freight traffic manager, rates and divisions, of the GREAT NORTHERN, has been named freight traffic manager, rates and divisions. Edward W. Bergstrom, general freight agent, has been appointed assistant freight traffic manager. Mr. Brown entered GN service in 1918 as voucher clerk in the

freight overcharge claims department, later serving there as traffic clerk, investigator and assistant rate clerk before transferring to the traffic department as traffic clerk. In 1941 he was promoted from commerce agent to assistant general freight agent; in 1945 was further promoted to general freight agent, and in 1948 was appointed to his most recent position.



Vincent P. Brown

Mr. Bergstrom entered GN traffic work in 1920, holding various clerical positions up to 1935, when he was named assistant to assistant freight traffic manager. He was appointed city freight agent at St. Paul in 1937;

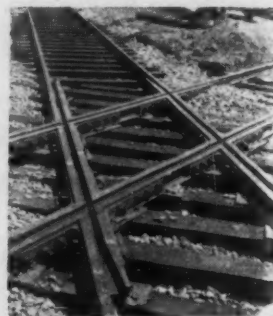
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C & NW has a NEW application for **WAUKESHA** *Diesel* **ENGINATORS®**



A Steam Generator Car—

One of the Northwestern's latest types of equipment—will produce 3750 pounds of steam per hour at 200-pound pressure. A self-contained unit, this car is an independent source of steam power for many services, such as powering pile drivers, or generating steam for emergency heating requirements.

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- ... operating electric drills, tools, and various small electric maintenance of way and repair equipment.
- ... electric flood lights when engaged in night work.
- ... the sole source of light, when generator car is in isolated location (supplying steam for pile driving, for example).



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special traffic representative in 1942; and assistant general freight agent in 1945. In 1946 he was promoted to his most recent position.

Eldon D. Pence, general agent of the KANSAS CITY SOUTHERN at Fort Smith, Ark., has been promoted to district traffic manager at Los Angeles (*Railway Age*, February 9). Mr. Pence joined the KCS in 1926 as messenger in the telegraph department, and worked in a number of clerical and stenographic positions in the car service and personnel departments and in the president's office before entering the traffic department in 1930. In

1947 he was appointed general agent at Fort Smith.

C. L. Hinnant has been appointed freight traffic manager of the ATLANTIC COAST LINE at Wilmington, N.C., succeeding **R. G. Hodgkin**, retired (*Railway Age*, March 9). Mr. Hinnant began his railroad career with the Southern in December 1904 at Atlanta, Ga., and joined the ACL in September 1906 as typist at Wilmington. He has since served as tariff clerk, divisions clerk, assistant general freight agent, general freight agent and assistant freight traffic manager.

Mr. Hodgkin was born at Washing-

ton, D.C., March 11, 1883, attended Lehigh University (1905), and entered railroad service with the Southern at Columbus, Miss., in August 1906, later



C. L. Hinnant

serving in the general freight office at Atlanta, Ga. In March 1911 he joined the ACL where he was, successively, assistant to general freight agent, as-



R. G. Hodgkin

sistant general freight agent and assistant freight traffic manager. He was appointed freight traffic manager at Wilmington June 1, 1940.

As reported in *Railway Age* February 16, **William D. Wakeman** has been appointed general freight agent, rates, of the JERSEY CENTRAL LINES, at New York. Mr. Wakeman was born August 11, 1900, at Newark, N.J., and attended Traffic Managers Institute, New York. He entered railroad service October 2, 1919, in the CNJ's Newark freight office, where he remained until 1932. He then served successively as foreman, East Ferry Street freight station, Newark; special representative, Port of Newark; and freight traffic representative at New York. Mr. Wakeman was appointed traveling freight agent at Albany, N.Y., in August 1944, general agent there in April 1945, general western freight agent at Chicago in April 1950, and

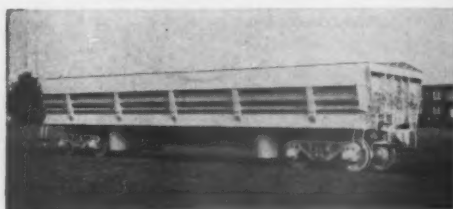
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DOUBLE ACTION — they dump cars both ways, to left or to right. The 50° dumping angle assures a clean dump, and the massive air cylinders (two on each side) assure speedy, reliable dumping power. The double trunnion, double fulcrum design are key features in Differential's amazing performance.

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Vertical grain car decking is here again—in abundance. It is called LAMIDEK.

What LAMIDEK is. LAMIDEK is laminated Douglas fir car decking produced by sawing flat grain dimension into two-inch squares, placing the squares so that the face of the stock is entirely vertical grain, laminated and doweled. The result is vertical grain car decking produced from flat grain stock.

How LAMIDEK is used. For decking box, flat and gondola cars, baggage trucks, push cars, station platforms, and warehouse floors.

Why LAMIDEK is better. LAMIDEK vertical grain stock has a harder wearing

surface than flat grain, wears more evenly, does not splinter or peel, and there is far less shrinkage. It is not easily broken through by heavy lift trucks, causing time loss for repairs.

What does LAMIDEK cost? Considering the fact that LAMIDEK should outwear and outlast two floors of flat grain stock, its original extra cost of approximately 35% over flat grain is a great saving, not only in the decking itself, but in the labor cost of renewal.

How to get LAMIDEK. Wire or write Wood Products Company for costs, and your delivery requirements. Your inquiry will receive immediate attention.

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*PATENT APPLIED FOR

general foreign freight agent at New York in October 1952.

As *Railway Age* announced February 9, **John G. Roberts** has been appointed general freight agent of the ARCHISON, TOPEKA & SANTA FE at San Francisco. **John R. Walter**, chief clerk at Albuquerque, N. M., has been named assistant general freight agent at San Francisco, succeeding **F. H. Hemphill**, who has been transferred to Los Angeles. Mr. Roberts, an employee of the Santa Fe since 1929, held a number of positions in the general freight traffic office at San Francisco before being promoted to assistant general freight agent

at Amarillo, Tex., in 1948. He transferred to Los Angeles in 1951. Mr. Walter joined the Santa Fe in 1936, serving in a number of positions in the general freight office at San Francisco. During World War II he served in the U. S. Navy.

Robert T. Phillips, general agent for the ERIE at Akron, Ohio, has been promoted to general coal freight agent at Cleveland, succeeding **John A. Ferguson**, whose retirement was reported in *Railway Age* February 9. **John L. Tjaden**, general agent at Springfield, Ohio, has been promoted to division freight agent at Marion, Ohio,

succeeding **Edwin H. Huffman**, who has been transferred to Jersey City, N.J. Mr. Huffman replaces **Frank K. Corlett**, who succeeds Mr. Phillips.

PURCHASES & STORES

H. A. Smith, purchasing agent of the TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS, has retired. Succeeding Mr. Smith is **H. T. Semple**.

G. M. Carr has been appointed assistant purchasing agent of the NORTHERN PACIFIC at St. Paul, succeeding **W. H. Post**, who died recently.

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Overseas

New RR Begun In Colombia

Construction of the Magdalena Valley Railroad, which will parallel the middle Magdalena river in Colombia for 240 miles, began recently at La Dorado, southern terminus of the line, according to *Foreign Commerce Weekly*. Completion is scheduled for 1956.

A U.S. firm has received a contract for constructing part of the line and two additional sections will be built by Colombian firms. Two large bridges and several smaller bridges will be built by a U.S. steel company.

Austria.—Last link in electrification of the Austrian Federal Railways from the Swiss border to Vienna was completed recently between Amstetten and Vienna, according to *Foreign Commerce Weekly*. Of the entire A.F.R. system, 1,340 kilometers, or 22.3 per cent, has been electrified, and 37.7 per cent of mainline has been electrified. About 90 per cent of electric power consumed by the railways, including that needed for repair shops and lighting, etc., is furnished by plants operated by the railways. The remaining 10 per cent is furnished by other government owned power plants. Projects for 1953 include electrification of the line from Arnoldstein to Tarvisio, expected to be finished early in the year; completion of the railway power plant at Braz; and construction of 15 to 20 electric locomotives.

Brazil.—A program for rehabilitating the Rede Mineira Railway and a request for consideration of a \$7,040,953 loan to accomplish the project has been submitted to the International Bank for Reconstruction and Development, according to *Foreign Commerce Weekly*. The money would cover foreign exchange requirements for relaying new and heavier rail and rail accessories on about 41 per cent of the most important sections of the road's lines,

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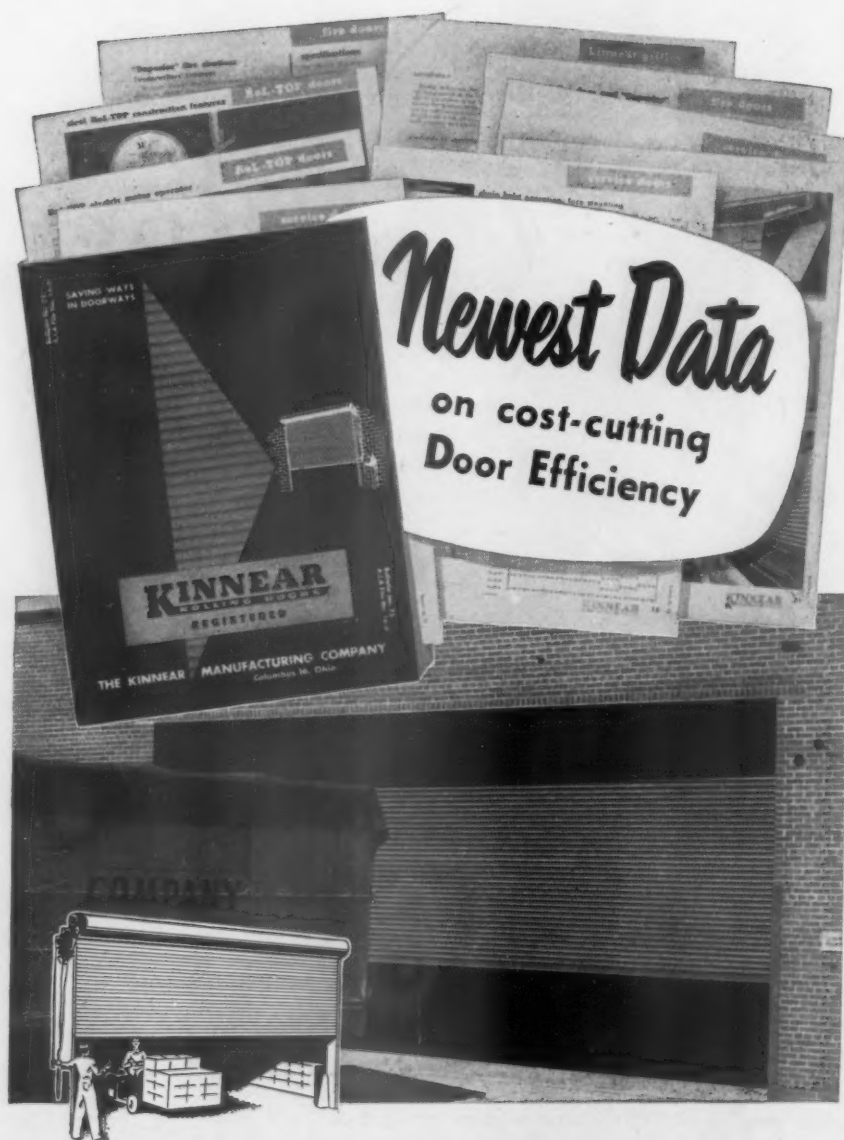
Railway Age is the weekly business paper of the railway industry ... the publication which covers all important developments from the executive and managerial standpoint. It covers the news ... reports departmental developments ... covers traffic, operation and financial activity. It is the specialized publication with the business and management point-of-view. It's a paid audited circulation publication ... a member of the A.B.C. and A. B. P.

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the report added. The plan also includes rebalasting and purchase of equipment and locomotives.

Malaya.—The most difficult stretches of the new railroad connecting eastern and western Malaya have been completed, and it is expected that some trains will be able to operate by next June, although general open-line operations may not begin until six months later, according to Foreign Commerce Weekly. Officers of the government-owned railroad reportedly said the new line, which will run for about 327 miles from Gemas to Tumpat, is only 42 miles short of completion. The cost of the project, 30,000,000 Malayan dollars, is being met by revenue funds set aside for rehabilitation expenditures.

Norway.—A new electrification plan for this country's State Railways, covering 720 miles of roadbed over a period of 11 years, has been passed unanimously by the Storting, Norway's parliament, according to Foreign Commerce Weekly. Total cost of projects included in the plan, on the basis of 1951 prices, is about 393,000,000 crowns (7.135 Norwegian crowns equal \$1 U.S.).

Work called for by the plan is largely a continuation of projects which have been or will be completed under an electrification plan passed by the Storting just before the German invasion in 1940. Twenty-three per cent of the total mileage of Norwegian railroads is now electrified and about 50 per cent of the traffic is being carried on electrified lines. Corresponding figures after completion of the new projects will be 56 per cent and 85 per cent.

Pakistan.—Establishment of a United Nations Regional Railway Training Center in Lahore, Pakistan, has been endorsed by the Inland Transport Committee of the United Nations Economic Commission for Asia and the Far East. Operations at the center are scheduled to begin next August 15.

Thailand.—The Railway Administration has invited bids for supply of three locomotive breakdown cranes and match trucks with a loading capacity of 35 metric tons for meter-gage track, according to Foreign Commerce Weekly. A copy of the specifications, and conditions for bidding, may be borrowed from the Commercial Intelligence Division, U. S. Department of Commerce, Washington 25, D.C.

Venezuela.—Proposals by three groups of Venezuelan construction firms for building a railroad between Puerto Cabello and Barquisimato, 187 kilometers (117 miles), are being studied by the Communications Ministry, according to Foreign Commerce Weekly. It is expected the project would cost 45 million bolivares (approximately \$13.5 million).

Current Publications

PERIODICAL ARTICLE

Portrait: White of the New York Central. Fortune, March 1953, pp. 126 and 158. Time, Inc., 9 Rockefeller plaza, New York 20. Single copies, \$1.25.

A brief biography of William White, president of the NYC since last summer, and a discussion of what he hopes to do to improve service on the system.

PAMPHLETS

Color Standards and Color Research. 20 pages. Faber Birren & Co., 500 Fifth ave., New York 36. Free.

This little pamphlet is said to be the only complete listing of publications describing colors which are recognized as standard for various industrial uses. A.A.R. Signal Section specifications for railroad signal glasses and at least two safety color codes are included.

Productivity and Economic Progress, by Frederick C. Mills. 36 pages, charts. Occasional paper 38. National Bureau of Economic Research, Inc., 1819 Broadway, New York 23. 75 cents.

Dr. Mills' paper is devoted to four basic trends in the growth of the United States economy over the last half century: the five-fold increase in real national product, the doubling of population, the increase of the output per capita of the population by two and one-half times, and the increase in output per man-hour of labor input by nearly three times. Besides attempting to determine the magnitudes of these elements, Dr. Mills seeks to outline the uses to which our expanding productive power has been put and to define some aspects of the pattern of progress over this half century of economic expansion. Productivity gains, he emphasizes, are a measure of the effectiveness with which employed resources are used, not of the effectiveness with which total available resources have been used. Also, they are not an indication of the output that might have been won had all resources been employed.

BOOKS

Canada: The Golden Hinge, by Leslie Roberts. 288 pages, illustrations. Clarke, Irwin & Co., 103 St. Clair ave., W., Toronto 5, Ont. \$3.50.

Mr. Roberts, in this study, reveals the face of modern Canada. He reports on the Maritimes; on the industrial "Heartland," that narrow corridor where almost half of Canada's population lives; he travels west to Canada's breadbasket, and to the fabulous land beyond the Rockies; he flies in the path of the bush pilots, north from Edmonton to the land of gold and uranium, and from Sept Isles to a forbidding territory where a new mineral empire is being founded in the Labrador Trough.

A Picture History of B&O Motive Power, by Laurence W. Sagle. 82 pages, illustrations. Simmons-Boardman Publishing Corporation, 30 Church st., New York 7. \$3.75.

Over a period of five years the Baltimore

& Ohio ran a series of articles in its company magazine entitled "The Motive Power of the B&O." Because of the demand for the articles it was decided to reprint them in a book. The material has been brought up to date and a chapter on the very early locomotives has been added. The photographs and accompanying text cover all periods, beginning with the "Tom Thumb" and continuing right up to the giant diesels in service today.

The Steam Locomotive in America; Its Development in the Twentieth Century, by Alfred W. Bruce. 443 pages, illustrations, drawings. W. W. Norton & Co., 101 Fifth ave., New York 3. \$7.50.

The author, who was director of loco-

motive engineering for the American Locomotive Company at the time of his retirement in 1946, records in this volume the main historical events in development of the steam locomotive and its achievements during the years 1901 to 1950, a period which, in his introduction, he calls the great age of steam. His history is devoted primarily to the technical details of how this development progressed, with specific reference to improvements in basic elements of the steam locomotive, different forms of power transmission from steam cylinder to rails, and the development of individual types both in main-line and special services. For the sake of completeness, an introductory historical chapter on the growth of railroads in the United

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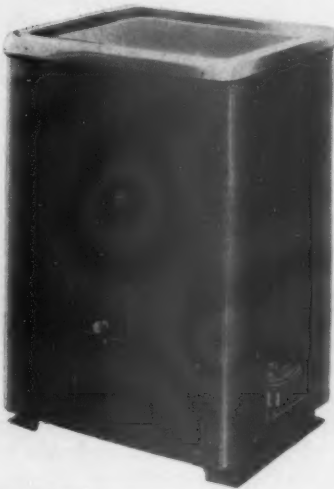
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States has been added; also a short history of the locomotive-building industry from the earliest times to the present, and a brief account of the development and progress of the steam locomotive from its beginnings in the days of Newcomen and Watt to the end of the nineteenth century. To parallel the actual transition from steam to diesel operation that has taken place during the past 10 or 12 years, a chapter has been included on development of electric and diesel-electric locomotives, with a summary of the advantages of each of the latter.

United States Railroad Administration Publications; A Bibliography, compiled by Helen R. Richardson. 212 pages. Association of American Railroads, Bureau of

Railway Economics Library, Transportation bldg., Washington 6, D.C. Free.

This bibliography has been arranged in three parts. Part I covers laws and proclamations governing control and operation of railroads, the organization as set up under the Director General, and publications issued by various divisions and regions of the Railroad Administration. Part II is a list, alphabetically, of all material related to the Railroad Administration and the Director General cataloged and filed in the Bureau of Railway Economics library. Part III is made up of five appendices: alphabetical lists of circulars, orders, and agreements with individual railroads, equipment trust agreements with

individual railroads, and final settlements with individual railroads. Eight libraries having transportation collections were checked for their collections of Railroad Administration material and their holdings are indicated in Part I.

Lines of Character, by L. T. C. Rolt, in association with P. B. Whitehouse. 188 pages, illustrations. Constable & Co., 10 Orange st., W.C.2, London, England. Available in this country from the Macmillan Company, 60 Fifth ave., New York 11. \$4.

Although the main lines are not wholly ignored, Mr. Rolt has been more concerned with exploring the remote and lesser known "outposts and byways" of the British railway system. In his introduction he says "This book makes no claim to add new facts to the already vast store recorded in railway literature. It is an evocation of that varied regional character of railways which is ebbing away as a result of standardization or the closure of branch lines. . . . The choice of 'lines of character' has been purely personal. . . . Some could be described as main lines, or at least as through routes of importance, but the majority are railway byways. Some are of narrow gage and some are standard; some flourishing and others moribund or already defunct; some 'nationalized' and others still independent. Some of the railways mentioned . . . derive their particular character from the country through which they pass, its beauty or the particular problems which beset the engineer or traffic superintendent. Others may merit attention because they are the last refuge of some 'pregrouping' locomotive type which will soon be extinct."

Basic Study in Traffic Management, by A. Allan Polakoff. 344 pages. Kenmore Press, 618 North Calvert st., Baltimore 2, Md. \$7.50.

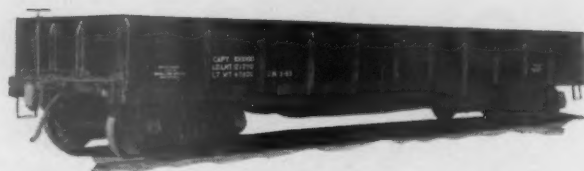
Following an introductory chapter on the history of transportation, Mr. Polakoff discusses shipping documents, freight classification, rates and tariff interpretation, special services, demurrage, the transit privilege, freight claims, and the freight forwarder. The book is written in easy to understand language and is designed to serve as a reference book for businessmen as well as a school and college text.

Sand In Their Shoes, by Franklin M. Reck. 153 pages. Published by American Steel Foundries, 410 N. Michigan ave., Chicago 11.

Here is a concise action-packed account of the development and accomplishments of American Steel Foundries, from its incorporation in 1902 to the present—with nine plants in 11 cities, 20 times its original productive capacity and a diversity of products and interests undreamed of in the early days. The contribution of this company to railroad progress is clearly pictured.

The author was given an exceptionally free hand in collecting information for this book. It is written in anecdote-type style, adding greatly to its interest and readability. The book is replete with instances such as that day in No-

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MAP

The American Ruhr, 16½ in. by 12¼ in., in color. Baltimore & Ohio, Traffic Department, Baltimore 1, Md. Free.

A map of America's fast-growing center of chemical industries—the upper Ohio River valley. Printed in six colors, it depicts natural resources, chemical-producing, metallurgical, plastics and power plants, and available industrial sites in this newly developed "Ruhr Valley of America." Locations of bituminous coal reserves, rock salt deposits and natural gas fields are shown, as well as sources of steel, ceramics materials, portland cement, brine and oil. Also shown are locations of nine new power plants, and several others under construction, as well as of many of the chemical, metallurgical and plastics industries which have been located in this area in the past decade. It covers the Ohio River valley between Ashland, Ky., and Wheeling, W. Va. It also shows the Muskingum River valley from Zanesville to Marietta, Ohio, where the Muskingum joins the Ohio.

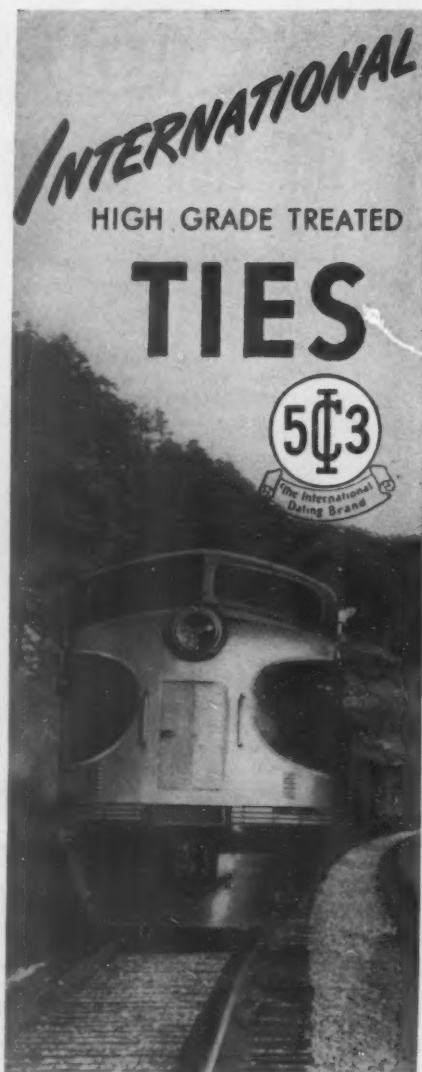
TRADE PUBLICATIONS

Case History of L&N, Railroad-Owned, Automatic Telephone System, Report No. 105. 12 pages, illustrations. Automatic Electric Sales Corporation, 1033 W. Van Buren st., Chicago 7. Free.

Prepared especially for railroad managements, this booklet explains how the Louisville & Nashville uses its railroad owned automatic telephone system in 10 of its large offices, shops and yard areas. In each city, dial telephones are provided in the offices of all L&N railroad men who need to communicate with each other. Furthermore, railroad owned trunk lines are provided between cities so that these men can "dial through" the automatic switchboards. For example, a road foreman of engines in New Orleans can call and speak directly to a shop foreman in Louisville. Thus, this is a railroad-wide inter-communication system, available around the clock to render unlimited service at a minimum operating expense.

Standardized Gravity and Power Units—Modern Time and Cost Savers. 28 pages, illustrations. Bulletin 63-C of the Standard Conveyor Company, North St. Paul 9, Minn.

A reprinting of the company's conveyor bulletin that includes both new products and added information on 11 standardized units. Full specifications of each unit are provided; in many instances, photographs show units in actual service. The bulletin covers gravity roller conveyors, spiral chutes, slides, wheel conveyors and roller spirals. Power units include "live" rollers, vertical lifts, belt conveyors, portable pilers, etc.



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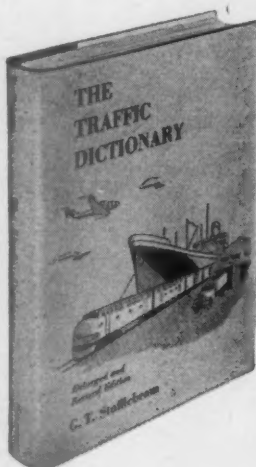
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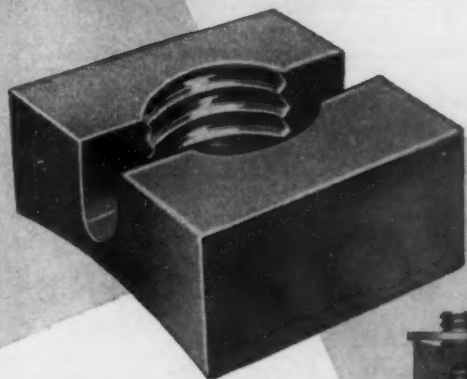
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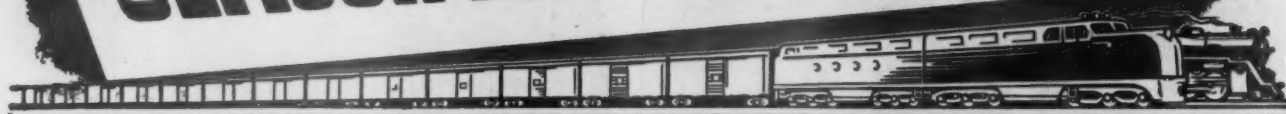


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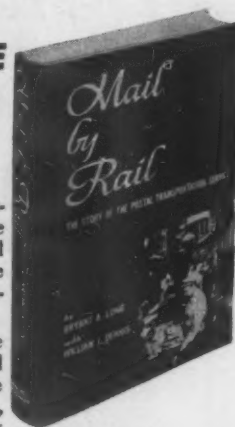
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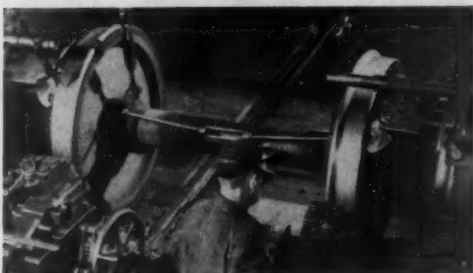
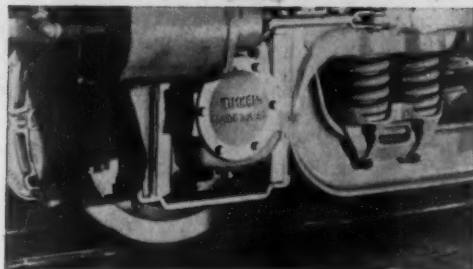
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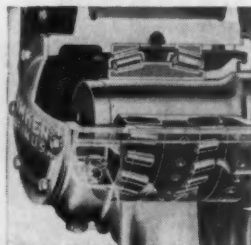
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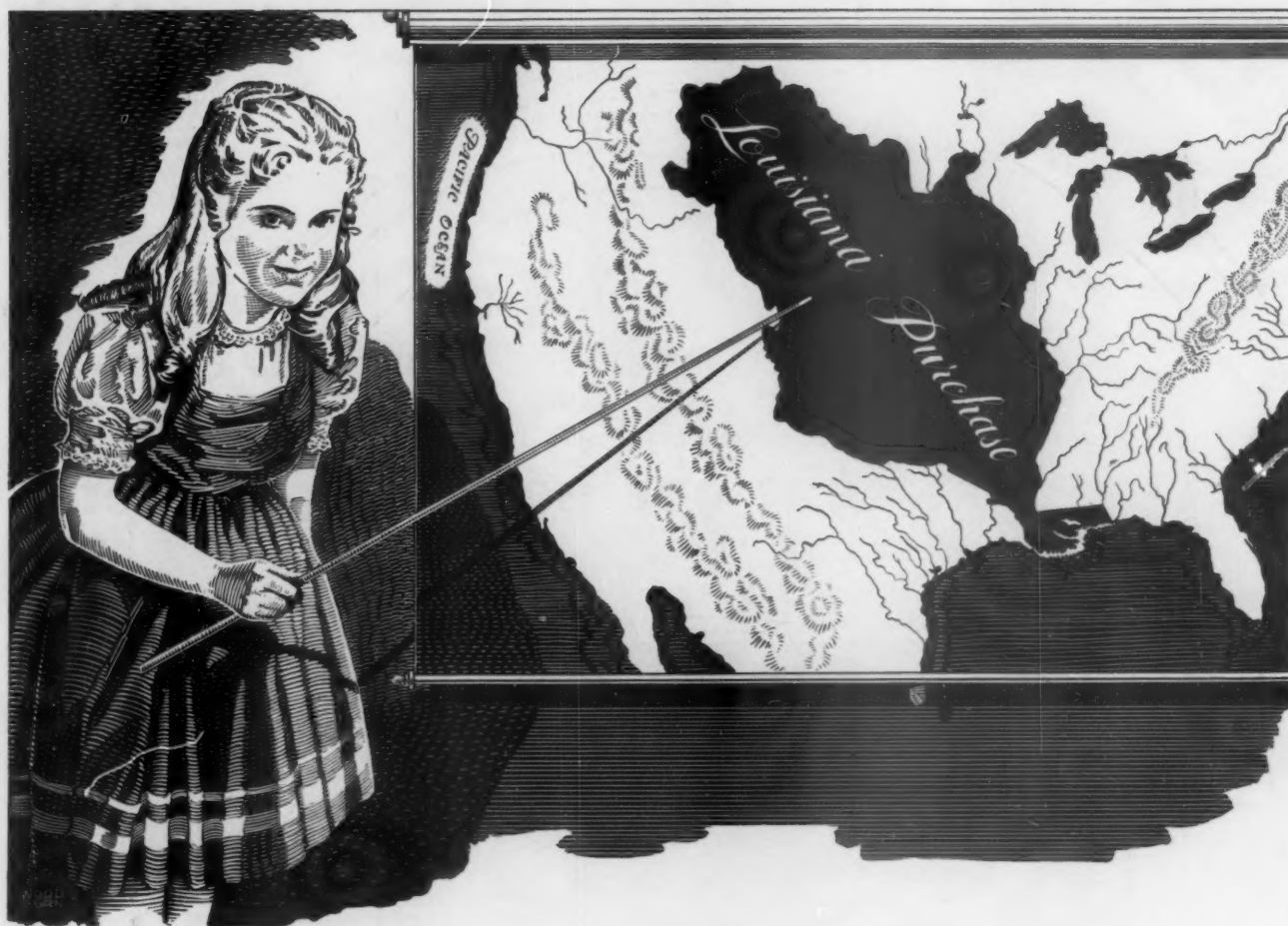
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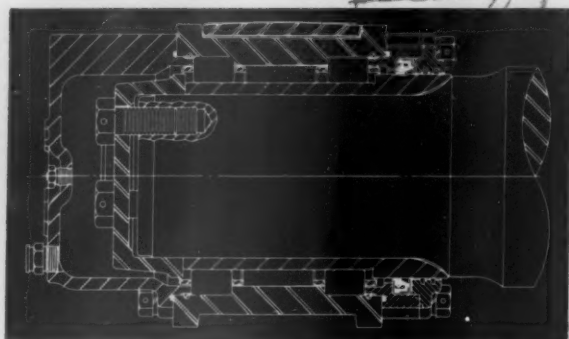
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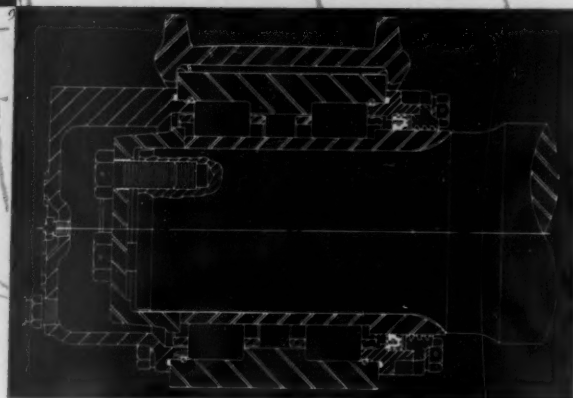
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Hyatt designs to solve your freight car hot box problem!



HYATT "PACKAGE" TYPE BOX shown opposite is for use in integral box side frames originally designed for plain bearings. Boxes are available in all standard journal sizes.

HYATT PEDESTAL-TYPE BOX shown below is designed to fit directly into a pedestal-type side frame. Boxes are available in all standard journal sizes.



Whether you are ordering new freight cars or converting old cars, Hyatt is ready to help you eliminate the tremendous cost of hot boxes. For Hyatt offers two easily-installed roller bearing journal boxes—one designed for freight car trucks having pedestal-type side frames, the other for trucks with integrally cast side frames.

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